

# Answer Sheet for Practice Test 3

## SECTION 1

Begin your essay on this page. If you need more space, continue on the next page. Do not write outside of the essay box.

A large rectangular box with a thin black border, containing 25 horizontal lines for writing. The lines are evenly spaced and extend across most of the width of the box, leaving a small margin on the left and right sides.

Continue on the next page if necessary.

Continuation of ESSAY Section 1 from previous page. Write below only if you need more space.

A large rectangular box containing 30 horizontal lines for writing.

Start with number 1 for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.

SECTION

2

1 (A) (B) (C) (D) (E)	11 (A) (B) (C) (D) (E)	21 (A) (B) (C) (D) (E)	31 (A) (B) (C) (D) (E)
2 (A) (B) (C) (D) (E)	12 (A) (B) (C) (D) (E)	22 (A) (B) (C) (D) (E)	32 (A) (B) (C) (D) (E)
3 (A) (B) (C) (D) (E)	13 (A) (B) (C) (D) (E)	23 (A) (B) (C) (D) (E)	33 (A) (B) (C) (D) (E)
4 (A) (B) (C) (D) (E)	14 (A) (B) (C) (D) (E)	24 (A) (B) (C) (D) (E)	34 (A) (B) (C) (D) (E)
5 (A) (B) (C) (D) (E)	15 (A) (B) (C) (D) (E)	25 (A) (B) (C) (D) (E)	35 (A) (B) (C) (D) (E)
6 (A) (B) (C) (D) (E)	16 (A) (B) (C) (D) (E)	26 (A) (B) (C) (D) (E)	36 (A) (B) (C) (D) (E)
7 (A) (B) (C) (D) (E)	17 (A) (B) (C) (D) (E)	27 (A) (B) (C) (D) (E)	37 (A) (B) (C) (D) (E)
8 (A) (B) (C) (D) (E)	18 (A) (B) (C) (D) (E)	28 (A) (B) (C) (D) (E)	38 (A) (B) (C) (D) (E)
9 (A) (B) (C) (D) (E)	19 (A) (B) (C) (D) (E)	29 (A) (B) (C) (D) (E)	39 (A) (B) (C) (D) (E)
10 (A) (B) (C) (D) (E)	20 (A) (B) (C) (D) (E)	30 (A) (B) (C) (D) (E)	40 (A) (B) (C) (D) (E)

SECTION

3

1 (A) (B) (C) (D) (E)	11 (A) (B) (C) (D) (E)	21 (A) (B) (C) (D) (E)	31 (A) (B) (C) (D) (E)
2 (A) (B) (C) (D) (E)	12 (A) (B) (C) (D) (E)	22 (A) (B) (C) (D) (E)	32 (A) (B) (C) (D) (E)
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5 (A) (B) (C) (D) (E)	15 (A) (B) (C) (D) (E)	25 (A) (B) (C) (D) (E)	35 (A) (B) (C) (D) (E)
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9 (A) (B) (C) (D) (E)	19 (A) (B) (C) (D) (E)	29 (A) (B) (C) (D) (E)	39 (A) (B) (C) (D) (E)
10 (A) (B) (C) (D) (E)	20 (A) (B) (C) (D) (E)	30 (A) (B) (C) (D) (E)	40 (A) (B) (C) (D) (E)

**CAUTION**

Use the answer spaces in the grids below for Section 2 or Section 3 only if you are told to do so in your test book.

**Student-Produced Responses**

ONLY ANSWERS ENTERED IN THE CIRCLES IN EACH GRID WILL BE SCORED. YOU WILL NOT RECEIVE CREDIT FOR ANYTHING WRITTEN IN THE BOXES ABOVE THE CIRCLES.

9	10	11	12	13
14	15	16	17	18

Each grid contains a 4-column header for writing answers, a row of bubbles for the answer key (A-E), a row of bubbles for the answer key (0-9), and a 9x4 grid of bubbles for the answer key (1-9).

Start with number 1 for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.

SECTION 4

4

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E
31	A	B	C	D	E
32	A	B	C	D	E
33	A	B	C	D	E
34	A	B	C	D	E
35	A	B	C	D	E
36	A	B	C	D	E
37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E
40	A	B	C	D	E

SECTION 5

5

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E
31	A	B	C	D	E
32	A	B	C	D	E
33	A	B	C	D	E
34	A	B	C	D	E
35	A	B	C	D	E
36	A	B	C	D	E
37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E
40	A	B	C	D	E

**CAUTION**

Use the answer spaces in the grids below for Section 4 or Section 5 only if you are told to do so in your test book.

**Student-Produced Responses**

ONLY ANSWERS ENTERED IN THE CIRCLES IN EACH GRID WILL BE SCORED. YOU WILL NOT RECEIVE CREDIT FOR ANYTHING WRITTEN IN THE BOXES ABOVE THE CIRCLES.

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9	9	9	9

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9	9	9	9

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6	6	6	6
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8	8	8	8
9	9	9	9

12

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6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

13

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1	1	1	1
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3	3	3	3
4	4	4	4
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6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

14

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3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

15

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1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

16

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1	1	1	1
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3	3	3	3
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6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

17

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6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

18

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1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Start with number 1 for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.

SECTION 6

6

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E
31	A	B	C	D	E
32	A	B	C	D	E
33	A	B	C	D	E
34	A	B	C	D	E
35	A	B	C	D	E
36	A	B	C	D	E
37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E
40	A	B	C	D	E

SECTION 7

7

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E
28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E
31	A	B	C	D	E
32	A	B	C	D	E
33	A	B	C	D	E
34	A	B	C	D	E
35	A	B	C	D	E
36	A	B	C	D	E
37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E
40	A	B	C	D	E

**CAUTION** Use the answer spaces in the grids below for Section 6 or Section 7 only if you are told to do so in your test book.

**Student-Produced Responses** ONLY ANSWERS ENTERED IN THE CIRCLES IN EACH GRID WILL BE SCORED. YOU WILL NOT RECEIVE CREDIT FOR ANYTHING WRITTEN IN THE BOXES ABOVE THE CIRCLES.

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6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

Start with number 1 for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.

SECTION

8

- |                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|
| 1 (A) (B) (C) (D) (E)  | 11 (A) (B) (C) (D) (E) | 21 (A) (B) (C) (D) (E) | 31 (A) (B) (C) (D) (E) |
| 2 (A) (B) (C) (D) (E)  | 12 (A) (B) (C) (D) (E) | 22 (A) (B) (C) (D) (E) | 32 (A) (B) (C) (D) (E) |
| 3 (A) (B) (C) (D) (E)  | 13 (A) (B) (C) (D) (E) | 23 (A) (B) (C) (D) (E) | 33 (A) (B) (C) (D) (E) |
| 4 (A) (B) (C) (D) (E)  | 14 (A) (B) (C) (D) (E) | 24 (A) (B) (C) (D) (E) | 34 (A) (B) (C) (D) (E) |
| 5 (A) (B) (C) (D) (E)  | 15 (A) (B) (C) (D) (E) | 25 (A) (B) (C) (D) (E) | 35 (A) (B) (C) (D) (E) |
| 6 (A) (B) (C) (D) (E)  | 16 (A) (B) (C) (D) (E) | 26 (A) (B) (C) (D) (E) | 36 (A) (B) (C) (D) (E) |
| 7 (A) (B) (C) (D) (E)  | 17 (A) (B) (C) (D) (E) | 27 (A) (B) (C) (D) (E) | 37 (A) (B) (C) (D) (E) |
| 8 (A) (B) (C) (D) (E)  | 18 (A) (B) (C) (D) (E) | 28 (A) (B) (C) (D) (E) | 38 (A) (B) (C) (D) (E) |
| 9 (A) (B) (C) (D) (E)  | 19 (A) (B) (C) (D) (E) | 29 (A) (B) (C) (D) (E) | 39 (A) (B) (C) (D) (E) |
| 10 (A) (B) (C) (D) (E) | 20 (A) (B) (C) (D) (E) | 30 (A) (B) (C) (D) (E) | 40 (A) (B) (C) (D) (E) |

SECTION

9

- |                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|
| 1 (A) (B) (C) (D) (E)  | 11 (A) (B) (C) (D) (E) | 21 (A) (B) (C) (D) (E) | 31 (A) (B) (C) (D) (E) |
| 2 (A) (B) (C) (D) (E)  | 12 (A) (B) (C) (D) (E) | 22 (A) (B) (C) (D) (E) | 32 (A) (B) (C) (D) (E) |
| 3 (A) (B) (C) (D) (E)  | 13 (A) (B) (C) (D) (E) | 23 (A) (B) (C) (D) (E) | 33 (A) (B) (C) (D) (E) |
| 4 (A) (B) (C) (D) (E)  | 14 (A) (B) (C) (D) (E) | 24 (A) (B) (C) (D) (E) | 34 (A) (B) (C) (D) (E) |
| 5 (A) (B) (C) (D) (E)  | 15 (A) (B) (C) (D) (E) | 25 (A) (B) (C) (D) (E) | 35 (A) (B) (C) (D) (E) |
| 6 (A) (B) (C) (D) (E)  | 16 (A) (B) (C) (D) (E) | 26 (A) (B) (C) (D) (E) | 36 (A) (B) (C) (D) (E) |
| 7 (A) (B) (C) (D) (E)  | 17 (A) (B) (C) (D) (E) | 27 (A) (B) (C) (D) (E) | 37 (A) (B) (C) (D) (E) |
| 8 (A) (B) (C) (D) (E)  | 18 (A) (B) (C) (D) (E) | 28 (A) (B) (C) (D) (E) | 38 (A) (B) (C) (D) (E) |
| 9 (A) (B) (C) (D) (E)  | 19 (A) (B) (C) (D) (E) | 29 (A) (B) (C) (D) (E) | 39 (A) (B) (C) (D) (E) |
| 10 (A) (B) (C) (D) (E) | 20 (A) (B) (C) (D) (E) | 30 (A) (B) (C) (D) (E) | 40 (A) (B) (C) (D) (E) |

SECTION

10

- |                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|
| 1 (A) (B) (C) (D) (E)  | 11 (A) (B) (C) (D) (E) | 21 (A) (B) (C) (D) (E) | 31 (A) (B) (C) (D) (E) |
| 2 (A) (B) (C) (D) (E)  | 12 (A) (B) (C) (D) (E) | 22 (A) (B) (C) (D) (E) | 32 (A) (B) (C) (D) (E) |
| 3 (A) (B) (C) (D) (E)  | 13 (A) (B) (C) (D) (E) | 23 (A) (B) (C) (D) (E) | 33 (A) (B) (C) (D) (E) |
| 4 (A) (B) (C) (D) (E)  | 14 (A) (B) (C) (D) (E) | 24 (A) (B) (C) (D) (E) | 34 (A) (B) (C) (D) (E) |
| 5 (A) (B) (C) (D) (E)  | 15 (A) (B) (C) (D) (E) | 25 (A) (B) (C) (D) (E) | 35 (A) (B) (C) (D) (E) |
| 6 (A) (B) (C) (D) (E)  | 16 (A) (B) (C) (D) (E) | 26 (A) (B) (C) (D) (E) | 36 (A) (B) (C) (D) (E) |
| 7 (A) (B) (C) (D) (E)  | 17 (A) (B) (C) (D) (E) | 27 (A) (B) (C) (D) (E) | 37 (A) (B) (C) (D) (E) |
| 8 (A) (B) (C) (D) (E)  | 18 (A) (B) (C) (D) (E) | 28 (A) (B) (C) (D) (E) | 38 (A) (B) (C) (D) (E) |
| 9 (A) (B) (C) (D) (E)  | 19 (A) (B) (C) (D) (E) | 29 (A) (B) (C) (D) (E) | 39 (A) (B) (C) (D) (E) |
| 10 (A) (B) (C) (D) (E) | 20 (A) (B) (C) (D) (E) | 30 (A) (B) (C) (D) (E) | 40 (A) (B) (C) (D) (E) |

SAT PRACTICE  
TEST 3

## SECTION 1

Time: 25 Minutes—Turn to page 760 of your answer sheet to write your ESSAY.

The purpose of the essay is to have you show how well you can express and develop your ideas. You should develop your point of view, logically and clearly present your ideas, and use language accurately.

You should write your essay on the lines provided on your answer sheet. You should not write on any other paper. You will have enough space if you write on every line and if you keep your handwriting to a reasonable size. Make sure that your handwriting is legible to other readers.

You will have 25 minutes to write an essay on the assignment below. *Do not write on any other topic. If you do so, you will receive a score of 0.*

Think carefully about the issue presented in the following quotations and the assignment below.

1. *While secrecy can be destructive, some of it is indispensable in human lives. Some control over secrecy and openness is needed in order to protect identity. Such control may be needed to guard privacy, intimacy, and friendship.*

Adapted from Sissela Bok, “The Need for Secrecy”

2. *Secrecy and a free, democratic government, President Harry Truman once said, don’t mix. An open exchange of information is vital to the kind of informed citizenry essential to healthy democracy.*

Editorial, “Overzealous Secrecy Threatens Democracy”

**Assignment:** Do you believe that people need to keep secrets, or do you believe that secrecy is harmful? Write an essay in which you develop your point of view on this issue. Support your position with reasoning and examples based on your own reading, observations, and experiences.

DO NOT WRITE YOUR ESSAY IN YOUR TEST BOOK. You will receive credit only for what you write on your answer sheet.

BEGIN WRITING YOUR ESSAY ON PAGE 760 OF THE ANSWER SHEET.

If you finish before time is called, you may check your work on this section only.  
Do not turn to any other section in the test.



## SECTION 2

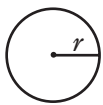
Time: 25 Minutes—Turn to Section 2 (page 762) of your answer sheet to answer the questions in this section.  
20 Questions

**Directions:** For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

**Notes:**

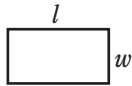
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- Unless otherwise specified, the domain of any function  $f$  is assumed to be the set of all real numbers  $x$  for which  $f(x)$  is a real number.

REFERENCE INFORMATION

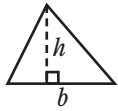


$$A = \pi r^2$$

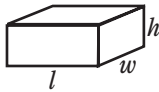
$$C = 2\pi r$$



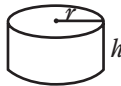
$$A = lw$$



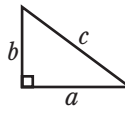
$$A = \frac{1}{2}bh$$



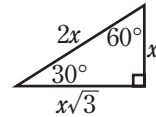
$$V = lwh$$



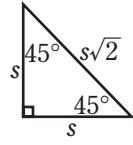
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



*Special Right Triangles*



The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

1. A certain number is divided by 3, but its value remains the same. What is this number?

- (A)  $-1$   
 (B)  $-\frac{1}{2}$   
 (C)  $0$   
 (D)  $\frac{1}{2}$   
 (E)  $1$

2. A man walks a certain distance in the direction  $30^\circ$  south of west, stops, and then turns  $35^\circ$  to his right. In what new direction is he facing?

- (A)  $65^\circ$  north of west  
 (B)  $35^\circ$  north of west  
 (C)  $32\frac{1}{2}^\circ$  north of west  
 (D)  $30^\circ$  north of west  
 (E)  $5^\circ$  north of west

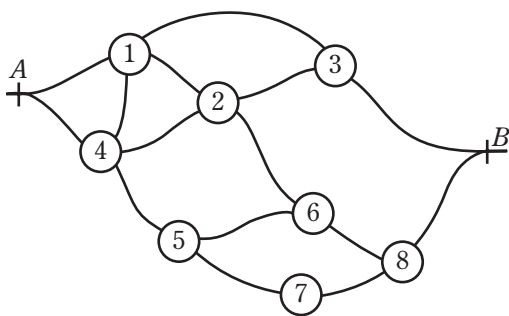
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3. What is the value of  $\frac{1}{5}K$  if  $\frac{9}{5}K = 18$ ?

- (A)  $\frac{1}{9}$
- (B)  $\frac{1}{5}$
- (C) 2
- (D) 5
- (E) 10

5. Let  $x$ ,  $y$ , and  $z$  be negative numbers such that  $x < y < z$ . Which expression is the smallest?

- (A)  $(z)(z)$
- (B)  $(y)(z)$
- (C)  $(x)(z)$
- (D)  $(y)(x)$
- (E)  $(x)(x)$



4. The figure above is a piece of fishnet. Which of the following statements must be true about an ant crawling on the net from Point A to Point B?

- (A) If it goes through 2, it must go through 7.
- (B) If it goes through 3, it must go through 1.
- (C) Its route must go through either 2 or 7.
- (D) If it goes through 4, it must go through 3 or 5.
- (E) If it goes through 8, it must go through 2 or 5.

6. A sequence of integers is defined as follows: The first term is 2, and every additional term is obtained by subtracting 2 from the previous term and tripling the resulting difference. For example, the second term would be 0. Which of the following is a true statement about this sequence?

- (A) The terms behave as follows: even, even, odd, odd, even, even, odd, odd,...
- (B) The terms behave as follows: even, odd, even, odd, even, odd,...
- (C) The terms behave as follows: even, even, even, odd, odd, odd, even, even, even,...
- (D) All of the terms, except for the first one, are odd.
- (E) All of the terms are even.

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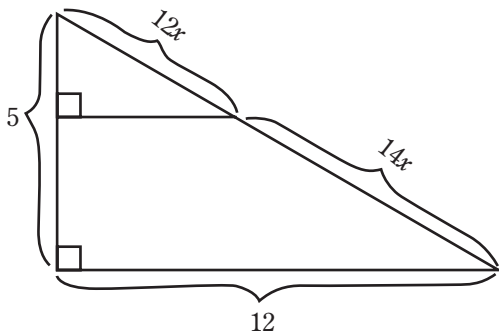
$$A = \left\{ \frac{3}{8}, 2, \frac{3}{2}, 6, \frac{13}{2}, 8 \right\}$$

$$B = \left\{ \frac{3}{8}, \frac{8}{3}, 6, 8 \right\}$$

7. If  $n$  is a member of both the sets A and B above, which of the following must be true?

- I.  $n$  is an integer
- II.  $8n$  is an integer
- III.  $n = 6$

- (A) None
- (B) I only
- (C) II only
- (D) III only
- (E) I and II only

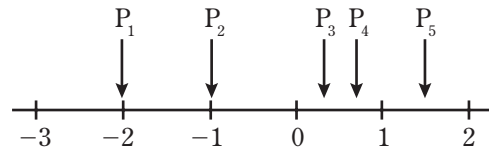


8. If the segments shown in the diagram have the indicated lengths, find the value of  $x$ .

- (A) 13
- (B) 12
- (C) 5
- (D) 2
- (E)  $\frac{1}{2}$

9. If  $x$  and  $y$  are integers such that  $1 < |x| < 5$  and  $2 < |y| < 7$ , what is the least possible value of  $x + y$ ?

- (A) -10
- (B) -8
- (C) -5
- (D) 5
- (E) 10

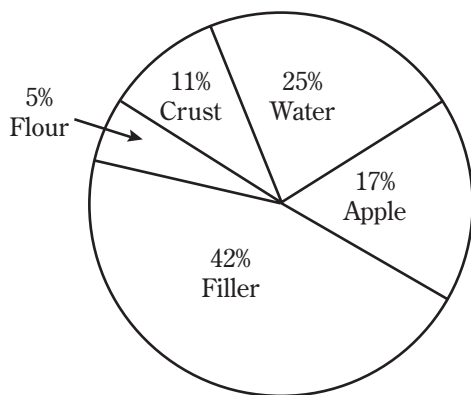


10. For the five numbers marked above by arrows, the best approximation to their product is

- (A)  $\frac{1}{3}$
- (B)  $\frac{2}{3}$
- (C)  $\frac{3}{2}$
- (D) 3
- (E) -3

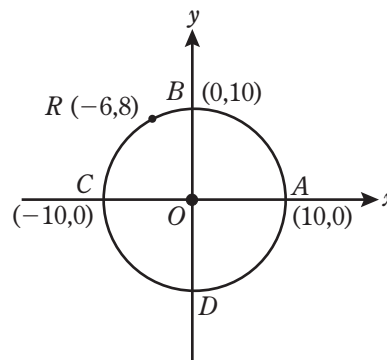
11. If  $K$  is the sum of three consecutive even integers and  $y$  is the sum of the greatest three consecutive *odd* integers that precede the least of the three even integers, express  $y$  in terms of  $K$ .
- (A)  $y = K - 5$   
 (B)  $y = K - 10$   
 (C)  $y = K - 15$   
 (D)  $y = K - 20$   
 (E) The answer cannot be determined from the information given.

13. The number of subsets of the set  $\{1,2,3\}$  is
- (A) 4  
 (B) 5  
 (C) 6  
 (D) 7  
 (E) 8



Apple Pie Ingredients

12. If John buys a 2 lb apple pie with ingredients distributed as shown, how much of his pie is water?
- (A)  $\frac{1}{4}$  lb  
 (B)  $\frac{1}{2}$  lb  
 (C)  $\frac{3}{4}$  lb  
 (D) 1 lb  
 (E)  $1\frac{1}{4}$  lb

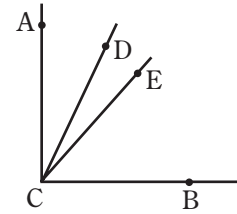


14. In the figure above,  $S$  is a point (not shown) such that segment  $RS$  divides the area of circle  $O$  into two equal parts. What are the coordinates of  $S$ ?
- (A)  $(6, -8)$   
 (B)  $(6, 8)$   
 (C)  $(8, -6)$   
 (D)  $(-6, -8)$   
 (E)  $(8, 6)$

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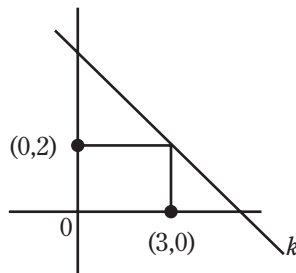
	First Place (6 points)	Second Place (4 points)	Third Place (2 points)
Game 1			
Game 2		Arisa	
Game 3			Arisa

15. The figure above is a partially filled-in score card for a video game contest. Isaac, Arisa, and Dylan each played in all of the three games. There were no ties. What is the *minimum* possible score for Dylan in this tournament?
- (A) 2  
 (B) 6  
 (C) 8  
 (D) 12  
 (E) The answer cannot be determined from the information given.



Note: Figure is not drawn to scale.

17. Given that  $AC \perp BC$ ,  $\angle DCB = 62^\circ$ , and  $\angle ACE = 37^\circ$ , find  $\angle DCE$  in degrees.
- (A)  $5^\circ$   
 (B)  $9^\circ$   
 (C)  $13^\circ$   
 (D)  $25^\circ$   
 (E)  $27^\circ$



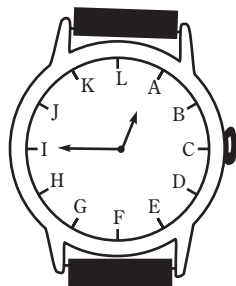
16. In the above figure, if line  $k$  has a slope of  $-1$ , what is the  $y$ -intercept of  $k$ ?
- (A) 4  
 (B) 5  
 (C) 6  
 (D) 7  
 (E) 8

18. Over the first few weeks of the baseball season, the league's five leading pitchers had the following won–lost records. (All games ended in a win or loss for that pitcher.)

	Won	Lost
Pitcher A	4	2
Pitcher B	3	2
Pitcher C	4	1
Pitcher D	2	2
Pitcher E	3	1

At the time these statistics were compiled, which pitcher was leading the league in winning percentage? (That is, which pitcher had won the greatest percentage of his games?)

- (A) Pitcher A  
 (B) Pitcher B  
 (C) Pitcher C  
 (D) Pitcher D  
 (E) Pitcher E



19. In the watch shown above, the normal numbers 1, 2, 3, ..., 12 have been replaced by the letters A, B, C, ..., L. In terms of these letters, a correct reading of the time shown would be

(A) I minutes after L  
 (B) 3E minutes before A  
 (C) 5C minutes after L  
 (D) I minutes before A  
 (E) None of the above

20. 27 equal cubes, each with a side of length  $r$ , are arranged so as to form a single larger cube with a volume of 81. If the larger cube has a side of length  $s$ , then  $r$  divided by  $s$  equals

(A)  $\frac{1}{3}$   
 (B)  $\frac{1}{\sqrt{3}}$   
 (C)  $\frac{1}{2}$   
 (D)  $\frac{1}{8}$   
 (E)  $\frac{1}{27}$

**STOP**

If you finish before time is called, you may check your work on this section only.  
 Do not turn to any other section in the test.

**Take a 5 minute break**  
 before starting section 3

## SECTION 3

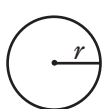
Time: 25 Minutes—Turn to Section 3 (page 762) of your answer sheet to answer the questions in this section.  
20 Questions

**Directions:** For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

**Notes:**

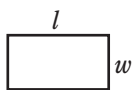
1. The use of a calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
4. Unless otherwise specified, the domain of any function  $f$  is assumed to be the set of all real numbers  $x$  for which  $f(x)$  is a real number.

REFERENCE INFORMATION

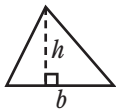


$$A = \pi r^2$$

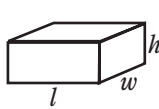
$$C = 2\pi r$$



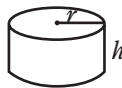
$$A = lw$$



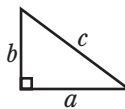
$$A = \frac{1}{2}bh$$



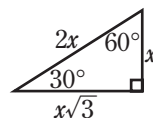
$$V = lwh$$



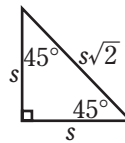
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



*Special Right Triangles*



The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

1. A piece of rope is lying on a number line. One of its ends is at coordinate  $-4$ , and the other is at coordinate  $7$ . What is the length of the rope?
  - (A) 3
  - (B) 5
  - (C) 7
  - (D) 9
  - (E) 11
2. A long jumper has jumps of 8.4 meters, 8.1 meters, and 9.3 meters. What is the average (arithmetic mean) of these jumps?
  - (A) 8.5
  - (B) 8.6
  - (C) 8.7
  - (D) 8.8
  - (E) 8.9

GO ON TO THE NEXT PAGE

3. If  $x + 9 = -11 - x$ , then  $x =$

- (A)  $-10$
- (B)  $-2$
- (C)  $2$
- (D)  $10$
- (E)  $20$

5. Jayden deposited \$50 in a savings bank at the beginning of the year. Jayden's money earns him interest at the rate of 8 percent of the amount deposited, for each year that Jayden leaves his money in the bank. If Jayden leaves his \$50 in the bank for exactly one year and then decides to withdraw all of his money, how much money (including interest) can he withdraw? (The interest is not compounded.)

- (A) \$50.04
- (B) \$50.08
- (C) \$54.00
- (D) \$54.08
- (E) \$58.00

4. If  $3y = 12$  and  $\frac{10}{x} = 5$ , then  $\frac{y + 11}{x + 15} =$

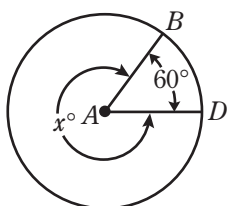
- (A)  $\frac{7}{10}$
- (B)  $\frac{3}{4}$
- (C)  $\frac{15}{17}$
- (D)  $1$
- (E)  $\frac{17}{15}$

6. If  $(x + 6)^2 = 12x + 72$ , then  $x =$

- (A)  $0$
- (B)  $\pm 1$
- (C)  $\pm 3$
- (D)  $\pm 6$
- (E)  $\pm 12$

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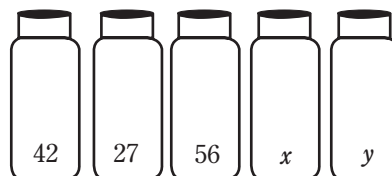
Note: Figure is not drawn to scale.

7. In the circle above,  $A$  is the center of the circle. Find the value of  $x - 60$ .
- (A) 60  
 (B) 120  
 (C) 240  
 (D) 300  
 (E) 360

9. If  $\nabla x$  is defined by the equation  $\nabla x = \frac{x^3}{4}$  for real numbers  $x$ , which of the following equals 16?

- (A)  $\nabla 2$   
 (B)  $\nabla 4$   
 (C)  $\nabla 8$   
 (D)  $\nabla 16$   
 (E)  $\nabla 64$

8. To the nearest hundred, how many minutes are there in a week?
- (A) 1,000  
 (B) 1,100  
 (C) 10,000  
 (D) 10,100  
 (E) 11,000

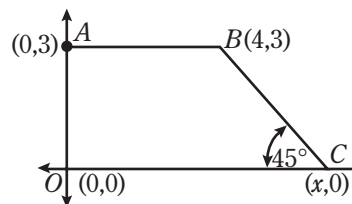


10. 200 pieces of candy have been randomly put into five jars. The number of pieces of candy in three of the five jars is shown in the figure above. What is the maximum possible value of  $x$ ? ( $x$  is the number of pieces of candy in the fourth jar.)
- (A) 69  
 (B) 75  
 (C) 102  
 (D) 144  
 (E) 200

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11. There are 16 pages in a booklet. Last night, Ron read  $\frac{1}{4}$  of the booklet. This morning, Ron read  $\frac{1}{4}$  of the remaining pages. How many pages does Ron still have left to read?

(A) 7  
 (B) 8  
 (C) 9  
 (D) 10  
 (E) 11



13. What is the area of quadrilateral  $ABCO$  in the figure above?

(A) 10.5  
 (B) 14.5  
 (C) 16.5  
 (D) 21.0  
 (E) The answer cannot be determined from the information given.

12. A different candle was lit at noon each day between December 9 and December 21, inclusive. How many candles were lit during this period?

(A) 10  
 (B) 11  
 (C) 12  
 (D) 13  
 (E) 14

14. The difference between the sum of two numbers and the difference of the two numbers is 6. Find the larger of the two numbers if their product is 15.

(A) 3  
 (B) 5  
 (C) 17  
 (D) 20  
 (E) 23

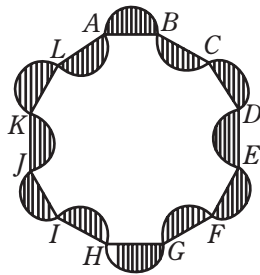
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15. If  $\frac{1}{a} + \frac{1}{b} = 10$ , what is the value of  $a + b$ ?

- (A)  $\frac{1}{10}$   
 (B)  $\frac{2}{5}$   
 (C) 1  
 (D) 10  
 (E) The answer cannot be determined from the information given.

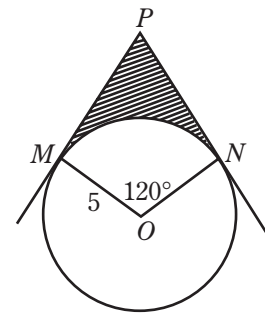
17. Brayden had  $b$  marbles and Carlos had  $c$  marbles. After Brayden gave 6 marbles to Carlos, Brayden still had 18 more marbles than Carlos. Find  $c - b$ .

- (A) 30  
 (B) 12  
 (C) 3  
 (D)  $-12$   
 (E)  $-30$



16. In the figure above,  $ABCDEFGHIJKL$  is a regular dodecagon (a regular twelve-sided polygon). The curved path is made up of 12 semicircles, each of whose diameters is a side of the dodecagon. If the perimeter of the dodecagon is 24, find the area of the shaded region.

- (A)  $6\pi$   
 (B)  $12\pi$   
 (C)  $24\pi$   
 (D)  $36\pi$   
 (E)  $48\pi$



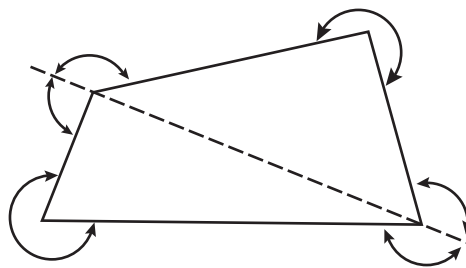
18.  $\overline{PM}$  and  $\overline{PN}$  are tangent to circle  $O$  at  $M$  and  $N$ , respectively;  $m\angle MON = 120^\circ$  and  $OM = ON = 5$ . Find the perimeter of the shaded region.

- (A)  $10 + 10\pi$   
 (B)  $5\sqrt{3} + 10\pi$   
 (C)  $5\sqrt{3} + \frac{10}{3}\pi$   
 (D)  $10\sqrt{3} + \frac{10\pi}{3}$   
 (E)  $10\sqrt{3} + 10\pi$

GO ON TO THE NEXT PAGE

19. If  $x + y + z = 3(a + b)$ , which of the following is the average (arithmetic mean) of  $x$ ,  $y$ ,  $z$ ,  $a$ , and  $b$  in terms of  $a$  and  $b$ ?

- (A)  $\frac{a + b}{5}$   
(B)  $\frac{4(a + b)}{15}$   
(C)  $\frac{a + b}{2}$   
(D)  $\frac{4(a + b)}{5}$   
(E)  $a + b$



20. The arrows in the diagram above represent all of the exterior angles of the figure. The sum of the degree measures of these angles is

- (A) 720  
(B) 1,080  
(C) 1,440  
(D) 1,800  
(E) The answer cannot be determined from the information given.

**STOP**

If you finish before time is called, you may check your work on this section only.  
Do not turn to any other section in the test.

## SECTION 4

Time: 25 Minutes—Turn to Section 4 (page 763) of your answer sheet to answer the questions in this section.  
24 Questions

**Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

Example:

Hoping to \_\_\_\_\_ the dispute, negotiators proposed a compromise that they felt would be \_\_\_\_\_ to both labor and management.

- (A) enforce...useful
- (B) end...divisive
- (C) overcome...unattractive
- (D) extend...satisfactory
- (E) resolve...acceptable

A  B  C  D  E

1. As a general dealing with subordinates, he was like two sides of a coin: \_\_\_\_\_ yet known for his severity, \_\_\_\_\_ yet a man of few words.
  - (A) agreeable...talkative
  - (B) brilliant...handsome
  - (C) fair...outgoing
  - (D) understanding...candid
  - (E) harsh...pleasant
2. The profession of a major-league baseball player involves more than \_\_\_\_\_ in these times when astronomical salaries and \_\_\_\_\_ contract bargaining are commonplace.
  - (A) skill...astute
  - (B) agitation...traditional
  - (C) practice...minimal
  - (D) enthusiasm...whimsical
  - (E) intellect...mystical
3. Internal dissension in this congressional committee can \_\_\_\_\_ affirmative action for months and increase the chances of racial \_\_\_\_\_.
  - (A) encourage...regard
  - (B) complicate...agreement
  - (C) induce...movement
  - (D) apply...validity
  - (E) delay...upheaval
4. Although there was considerable \_\_\_\_\_ among the members of the panel as to the qualities essential for a champion, Sugar Ray Robinson was \_\_\_\_\_ voted the greatest fighter of all time.
  - (A) suspicion...quietly
  - (B) disagreement...overwhelmingly
  - (C) discussion...incidentally
  - (D) sacrifice...happily
  - (E) research...irrelevantly
5. The police commissioner insisted on severity in dealing with the demonstrators rather than the \_\_\_\_\_ approach that his advisers suggested.
  - (A) arrogant
  - (B) defeatist
  - (C) violent
  - (D) conciliatory
  - (E) retaliatory
6. Feeling no particular affection for either of his two acquaintances, he was able to judge their dispute very \_\_\_\_\_.
  - (A) impartially
  - (B) accurately
  - (C) immaculately
  - (D) heatedly
  - (E) judiciously

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7. His choice for the new judge won the immediate \_\_\_\_\_ of city officials, even though some of them had \_\_\_\_\_ about him.
- (A) acclaim...reservations
  - (B) disdain...information
  - (C) apprehension...dilemmas
  - (D) vituperation...repercussions
  - (E) enmity...preconceptions
8. There are some individuals who thrive on action and, accordingly, cannot tolerate a \_\_\_\_\_ lifestyle.
- (A) passive
  - (B) chaotic
  - (C) brazen
  - (D) grandiose
  - (E) vibrant



GO ON TO THE NEXT PAGE

Each passage below is followed by questions based on its content. Answer the questions on the basis of what is stated or implied in each passage and in any introductory material that may be provided.

**Questions 9–10 are based on the following passage.**

A cliché is made, not born. The process begins when someone hits upon a bright new way of stating a common experience. At that point, the remark is an epigram. But if it is particularly apt as well as catchy, the saying receives  
5 wide circulation as verbal coin. Soon it is likely to be suffering from overwork. It has then arrived at cliché-hood. The dictionary records the doom of the successful epigram in defining a cliché: “A trite phrase; a hackneyed expression.” For the epigrammatist, the only cheer in this  
10 process is that it proves his expression was good. Even this situation is covered by a cliché: “Imitation is the sincerest form of flattery.”

9. The writer suggests that an epigram is
- (A) fresh
  - (B) trite
  - (C) ordinary
  - (D) cheerful
  - (E) noble
10. According to the author, the chief difference between an epigram and a cliché is in their
- (A) origin
  - (B) length
  - (C) meaning
  - (D) use
  - (E) purpose

**Questions 11–12 are based on the following passage.**

In the ordinary course of nature, the great beneficent changes come slowly and silently. The noisy changes, for the most part, mean violence and disruption. The roar of storms and tornadoes, the explosions of volcanoes, the  
5 crash of thunder, are the result of a sudden break in the equipoise of the elements; from a condition of comparative repose and silence they become fearfully swift and audible. The still small voice is the voice of life and growth and perpetuity. In the history of a nation it is the same.

11. As used in the passage, the word “equipoise” (line 6) most nearly means
- (A) stress
  - (B) balance
  - (C) course
  - (D) slowness
  - (E) condition
12. The author implies that growth and perpetuity in nature and in history are the result of
- (A) quiet changes
  - (B) a period of silence
  - (C) undiscovered action
  - (D) storms and tornadoes
  - (E) violence and disruptions

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**Questions 13–24 are based on the following passage.**

*The following passage is about the Depression, which was caused by the stock market crash of 1929, whose effect lasted into the subsequent decade.*

The American people were dismayed by the sudden proof that something had gone wrong with their economic system, that it lacked stability and was subject to crises of unpredictable magnitude. They had encountered hard times and temporary depressions before, and such reverses had tended for over a century to broaden out and to become international misfortunes. But the depression that began in 1929 proved so severe, so general, and so difficult to arrest, that it caused a “loss of nerve.”

Students of economics pointed out that periods of inflation and deflation, of “boom and bust,” had alternated for generations. Any strong stimulus such as a war might force the economy of the Western world into high gear; when the fighting ceased, reconstruction and a “backlog” of consumers’ orders unfilled in wartime might for a time keep the machines running at full speed; but within a decade the market was likely to become satiated and a fall in demand would then cause a recession. Adjustment and recovery were certain to come in time, and come the sooner if a new stimulus developed. The threat of another war, or war itself, that put millions of men in uniform and created a demand for munitions, was one such stimulus. War provided a limitless market for expendable goods, the type of goods the machines were best fitted to supply, and solved unemployment by creating more military and civilian jobs. Such reasoning as this brought no comfort, however, for it implied a choice between war and depression, and the cure was worse than the disease. “Is modern industry a sick giant that can rouse itself only to kill?” one critic asked. There was no clear answer. But the American people were not willing to accept such a grim diagnosis and insisted that there must be some method of coordinating a supply and demand within the framework of a peacetime economy.

The problem appeared to be as much psychological as economic. In prosperous times business expanded, prices rose, wages increased, and the expectation that the boom would continue indefinitely tempted people to live beyond their means. They purchased goods on credit, confident that they could meet the payments later. The increasing prosperity, in part genuine but overstimulated by optimism and artificial elements, encouraged farmers and manufacturers to overproduce until the supply exceeded the capacity of the market

to absorb it. Then when business confidence began to falter, and stock quotations began to drop, panic set in. Speculators who saw their “paper profits” vanishing began to unload their securities with a disastrous effect on prices. Dealers with overloaded shelves slashed their prices to keep their goods moving, and canceled outstanding orders. Manufacturers, seeing orders shrink, reduced output. All down the line the contraction of business left employees without jobs, and lacking wages they could not meet their debts. Once started, this spiral of deflation seemed to have no limit.

It is natural for people to blame others when misfortune strikes, and after 1929 the American people became suddenly critical of their business leaders, who had failed to foresee or avert the swift transition from prosperity to privation. The conviction spread that the heads of great banks and corporations, the promoters and financiers and stockbrokers, had misled the public. Demands raised earlier in American history were revived, demands for “cheap” money with which to pay off debts, demands that the great trusts and monopolies be investigated, demands that the federal government intervene to correct business abuses and aid the destitute. More and more people began to feel that the system of free business enterprise, of unregulated economic competition, so highly praised in the 1920s, must be wrong if it could lead to crises that brought such widespread misery and unemployment.

But President Hoover was firm in his conviction that the American economic system was fundamentally sound and that it would be a mistake for the government to interfere unduly. Government supervision and regulation of business, he felt, would stifle freedom and lead to government control of activities that should be left to private initiative. “You cannot extend the mastery of the government over the daily life of a people,” he warned, “without somewhere making it master of people’s souls and thoughts.” He believed that the government’s role should be limited to helping business help itself, and to this end he supported an act (1932) which created the Reconstruction Finance Corporation to aid ailing businesses, as well as hard-pressed states, with government loans. Hoover also inaugurated a public works program which he hoped would effectively relieve unemployment. But beyond such indirect measures as these he did not believe the federal government should go. Meanwhile the burden of providing direct relief for the millions of unemployed and their families was exhausting the resources of state and local governments and private agencies—and still the breadlines formed as jobs and savings went.

GO ON TO THE NEXT PAGE 



13. According to the passage, President Hoover
- (A) urged more and more government regulation
  - (B) did little or nothing to aid ailing business
  - (C) made efforts to relieve unemployment
  - (D) had sincere doubts about the soundness of the American economic system
  - (E) expressed the belief that we should convert gradually to a socialistic form of government
14. The author indicates that recovery from a recession most likely comes about
- (A) during wartime
  - (B) during peacetime
  - (C) by decreasing manufacturing
  - (D) by lowering wages
  - (E) by raising the interest rate
15. Which of the following was *not* a cause of the 1929 Depression?
- (A) too much buying on credit
  - (B) rising prices
  - (C) overproduction of goods
  - (D) lack of economic stability
  - (E) political unrest throughout the world
16. According to the passage, when the stock quotations began to drop,
- (A) manufacturers immediately increased output
  - (B) unemployment decreased
  - (C) there was a reduction of business
  - (D) dealers increased their prices
  - (E) speculators held on to their securities
17. As used in line 56, the word “privation” means
- (A) solitude
  - (B) lack of basic necessities
  - (C) strictness
  - (D) a smooth transition
  - (E) a reduction in the usual business sales rate
18. The word “inaugurated” in line 81 means
- (A) stifled
  - (B) amalgamated
  - (C) began
  - (D) commemorated
  - (E) oversaw
19. According to the passage, the Reconstruction Finance Corporation
- (A) remodeled old private and government buildings
  - (B) served as a price-regulating organization
  - (C) helped the unemployed to find jobs during the Depression
  - (D) gave government loans to certain businesses
  - (E) supported the unemployed by public relief programs
20. Which statement would the author *not* agree to?
- (A) There will continue to be economic crises.
  - (B) The end of the spiral of deflation was usually in sight.
  - (C) War tends to reduce unemployment.
  - (D) War is not the answer to avoiding economic depression.
  - (E) The Depression of 1929 had psychological roots.
21. As seen from the passage, as a result of the Depression
- (A) the value of the free enterprise system was questioned
  - (B) more people demanded that the government stay out of business
  - (C) people put more trust in business leaders
  - (D) a third of the population was unemployed
  - (E) the government was forced to increase taxes
22. The author would agree that war is economically advantageous in that
- (A) it implies a choice between war and depression
  - (B) it increases unemployment
  - (C) the market becomes satiated
  - (D) it solves bouts of inflation
  - (E) it increases aggregate demand
23. After 1929, the following demands were raised *except*
- (A) abolition of the great financial cartels
  - (B) cheap money
  - (C) investigation of trusts and monopolies
  - (D) intervention of the federal government to correct business abuses
  - (E) intervention of the federal government to aid the poor

24. As seen by the passage, the contraction of business in 1929 led to
- (A) war fever
  - (B) increased unemployment
  - (C) payment of debts
  - (D) demand exceeding supply
  - (E) skyrocketing prices

**STOP**

If you finish before time is called, you may check your work on this section only.  
Do not turn to any other section in the test.

**Take a 1 minute break**  
before starting section 5

## SECTION 5

Time: 25 Minutes—Turn to Section 5 (page 763) of your answer sheet to answer the questions in this section.  
35 Questions

**Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

The following sentences test correctness and effectiveness of expression. Part of each sentence or the entire sentence is underlined; beneath each sentence are five ways of phrasing the underlined material. Choice A repeats the original phrasing; the other four choices are different. If you think the original phrasing produces a better sentence than any of the alternatives, select Choice A; if not, select one of the other choices.

In making your selection, follow the requirements of standard written English; that is, pay attention to grammar, choice of words, sentence construction, and punctuation. Your selection should result in the most effective sentence—clear and precise, without awkwardness or ambiguity.

EXAMPLE:

Laura Ingalls Wilder published her first book and she was sixty-five years old then.

- (A) and she was sixty-five years old then
- (B) when she was sixty-five
- (C) at age sixty-five years old
- (D) upon the reaching of sixty-five years
- (E) at the time when she was sixty-five

A  B  C  D  E

1. The most primitive boat of all is the dugout canoe, being carved from a tree trunk.
  - (A) being carved from a tree trunk
  - (B) carving from a tree trunk
  - (C) carved from a tree trunk
  - (D) having been carved from a tree trunk
  - (E) its being carved from a tree trunk
2. Whether you can find a place to park your car is probably the hardest part of the day's outing.
  - (A) Whether you can find a place to park your car
  - (B) Finding a place to park your car
  - (C) To park your car in a place
  - (D) Taking your car to a place where you can park it
  - (E) Finding a car parking place near you
3. The trustee resigned in protest from the town board against its approval of the rent control law.
  - (A) in protest from the town board against its approval
  - (B) protesting against the approval by the town board
  - (C) from the town board in protest against its approval
  - (D) against the town board, protesting its approval
  - (E) in protest from the town board, protesting its approval
4. In the summer, the number of injuries from ladder falls soars.
  - (A) from ladder falls
  - (B) coming from people falling off their ladders
  - (C) because of falls from ladders
  - (D) caused by falls from ladders
  - (E) which come from the result of falls from ladders
5. Thousands of people are blind because their glaucoma has reached an advanced stage.
  - (A) because their glaucoma
  - (B) due to their glaucoma
  - (C) since they have their glaucoma and it
  - (D) having their glaucoma
  - (E) from their glaucoma

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6. Driving a racing car on a speedway is in some ways like when you are riding a horse on a bridle path.
- (A) is in some ways like when you are riding  
 (B) in some ways is in the same class as riding  
 (C) is in some ways similar to when you are riding  
 (D) is in some ways similar to riding  
 (E) is like a ride in some ways of
7. Seeing the security guard, the cigarettes were immediately concealed by the workers.
- (A) Seeing the security guard, the cigarettes were immediately concealed by the workers  
 (B) The security guard being seen by them, the workers immediately concealed the cigarettes  
 (C) The workers having seen the security guard, the cigarettes were concealed immediately  
 (D) When the workers saw the security guard, they immediately concealed the cigarettes  
 (E) When the security guard was seen, the workers immediately concealed the cigarettes
8. Henry VIII had many wives, Henry VI one, but each is remembered not for his women but for his talent.
- (A) Henry VIII had many wives, Henry VI one  
 (B) Henry VIII had many wives, Henry VI having one  
 (C) Henry VIII having many wives, Henry VI just one  
 (D) Henry VIII has had many wives, but Henry VI only one  
 (E) Henry VIII had many wives, Henry VI had only one wife
9. Biologists often say that it is not chemists or physicists but that they have the answer to the improvement of life on earth.
- (A) it is not chemists or physicists but that they have  
 (B) it is not chemists or physicists but they have  
 (C) they, and not chemists or physicists have  
 (D) it is not chemists or physicists but it is they who have  
 (E) it is they, not chemists or physicists, who have
10. The underprivileged student is getting a better education, there are better teachers for them and better facilities.
- (A) education, there are better teachers for them  
 (B) education; he has better teachers  
 (C) education; they have better teachers  
 (D) education, he has better teachers  
 (E) education; because he has better teachers
11. When the university administration changed its role from that of a judge and prosecutor to that of an adviser and friend, not only did the students stop their demonstrations but they also sided with the administration against the outsiders.
- (A) When the university administration changed its role from that of a judge and prosecutor to that of an adviser and friend  
 (B) When the university administration changed its role from that of a judge and prosecutor to an adviser and friend  
 (C) When the university administration changed its role from that of a judge and prosecutor to one of an adviser and friend  
 (D) As a result of the administration's changing its role from judge and prosecutor to that of adviser and friend  
 (E) As to the university administration, in changing its role from that of a judge and prosecutor to that of an adviser and friend



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The following sentences test your ability to recognize grammar and usage errors. Each sentence contains either a single error or no error at all. No sentence contains more than one error. The error, if there is one, is underlined and lettered. If the sentence contains an error, select the one underlined part that must be changed to make the sentence correct. If the sentence is correct, select Choice E. In choosing answers, follow the requirements of standard written English.

EXAMPLE:

The other delegates and him immediately  
 A B C  
 accepted the resolution drafted by  
 D  
 the neutral states. No error.  
 E

(A) ● (C) (D) (E)

12. You may not realize it but the weather in  
 A B  
 Barbados during Christmas is like New York in  
 C D  
 June. No error.  
 E
13. Stores were jammed with last-minute Christmas  
 A B  
 shoppers, and the festive spirit was greatly  
 C  
 disrupted by homemade bombs that exploded at  
 D  
 two department stores. No error.  
 E
14. The teacher did not encourage the student any  
 A  
 even though the boy began to weep when he  
 B  
was told that his poor marks would likely hold up  
 C D  
 his graduation. No error.  
 E
15. Allen has stated that he has always had a great  
 A B  
interest and admiration for the work of the British  
 C D  
 economist Keynes. No error.  
 E
16. Besides my job as a legal secretary, I also have a job  
 A  
as a condominium manager that requires me to  
 B C  
 solve a large amount of problems. No error.  
 D E
17. Who's to decide that certain terminally-ill patients  
 A B  
 should be taken off life-support systems while others  
 C D  
 should remain dependent upon machines? No error.  
 E
18. When the results of the polls were published in the  
 A  
 paper, my brother, who was a candidate for mayor,  
 B  
 was not discouraged any because he was among  
 C D  
 the top four candidates. No error.  
 E
19. A mother along with her five children were rescued  
 A B  
 from the burning apartment building by a postal  
 worker who was making his daily deliveries earlier  
 C  
than usual. No error.  
 D E
20. My partner in the computer class worked on the  
 A  
 same programs as I, but his method of solving the  
 B  
 problems was quite different than mine. No error.  
 C D E
21. The school board members did like they were  
 A B C  
expected to do when they decided to increase the  
 C  
 length of the school day rather than the length of  
 D  
 the school year. No error.  
 E

GO ON TO THE NEXT PAGE 

22. A woman perished on Sunday when the hot air  
A  
balloon in which she had rode caught fire as it  
B C  
touched down. No error.  
D E
23. From every community comes reports that there  
A B  
has been an increase in vandalism by teenagers.  
C D  
No error.  
E
24. When the hurricane struck, the people who  
A  
had gone to the shelter found that there wasn't  
B C  
scarcely enough food for everyone. No error.  
D E
25. By the time I graduate from law school, my sister  
A B  
will have been practicing law for three years.  
C D  
No error.  
E
26. I had to borrow a book off of my English instructor  
A  
since the campus bookstore had sold all the copies  
B C D  
of the required text. No error.  
E
27. Neither the school board members or the city  
A  
council wanted to change the school boundaries  
B C  
in order to reduce the over-enrollment. No error.  
D E
28. When my neighbor, who cannot swim, was a  
A B  
teenager, he had rescued a drowning swimmer by  
C D  
pulling him into his rowboat. No error.  
E
29. As an incentive to attend the local college, our  
A B  
father told my brother and I that we could use his  
C  
company car for transportation. No error.  
D E


 GO ON TO THE NEXT PAGE

**Directions:** The following passage is an early draft of an essay. Some parts of the passage need to be rewritten.

Read the passage and select the best answers for the questions that follow. Some questions are about particular sentences or parts of sentences and ask you to improve sentence structure or word choice. Other questions ask you to consider organization and development. In choosing answers, follow the requirements of standard written English.

**Questions 30–35 refer to the following passage.**

<sup>1</sup>We know that a proportion of our sleeping time is spent dreaming. <sup>2</sup>This is true for everyone, whether you are the kind of person who ordinarily remembers your dreams or not. <sup>3</sup>Often our dreams show us “the other side of the picture,” making us aware of things we have failed to take conscious note of during the day. <sup>4</sup>Moreover, if you dream that your new boss, who seems gruff and unfriendly during waking hours, is smiling at you and praising you for your work, perhaps you have subliminally picked up signals that day that his bark is worse than his bite.

<sup>5</sup>All of us need our dreams, and the younger we are, the more necessary they appear to be. <sup>6</sup>Babies spend nearly half their sleep in the dreaming phase. <sup>7</sup>When adult subjects in an experiment were given drugs that eliminated their dreaming for several nights, they became increasingly irritable and anxious, and often began having difficulty concentrating. <sup>8</sup>Too much dreaming appears to have its drawbacks too. <sup>9</sup>If you doze late on Sunday morning, you often wake up feeling tired. <sup>10</sup>The reason is that the longer you sleep, the longer your dreams become. <sup>11</sup>(Dreaming periods are short during the first part of the night and lengthen as your sleep progresses.)

30. The word Moreover, in sentence 4 should be

- (A) left as it is
- (B) changed to However,
- (C) changed to For instance,
- (D) changed to In short,
- (E) changed to Some people believe

31. Sentence 8 would be improved if

- (A) it were joined to sentence 7 with a semicolon
- (B) it were joined to sentence 7 with and
- (C) it began with Although
- (D) it began with Yet
- (E) it were placed after sentence 9

32. Sentence 10 should be

- (A) eliminated
- (B) joined to sentence 9 with a semicolon
- (C) joined to sentence 9 with a comma
- (D) placed at the end of the paragraph
- (E) shortened to read The longer you sleep, the longer your dreams become

33. Which of the following sentences would make the best introductory sentence to the passage?

- (A) Dreams have fascinated man since ancient times.
- (B) Many people dismiss dreams as unimportant.
- (C) You do not need a psychoanalyst to learn something from your dreams.
- (D) Socrates said dreams represented the voice of our consciences; Freud called them “the royal road to the unconscious.”
- (E) New research indicates that, night and day, dreams play an important part in all of our lives.

34. In sentence 7, the word When should be

- (A) left as it is
- (B) changed to If
- (C) changed to Only
- (D) changed to Before
- (E) changed to Nevertheless

35. What should be done with sentence 11?

- (A) The parentheses should be eliminated.
- (B) An exclamation point should be used instead of a period.
- (C) The sentence should be italicized.
- (D) The sentence should be made into two sentences without the parentheses.
- (E) It should be left as it is.

## STOP

If you finish before time is called, you may check your work on this section only.  
Do not turn to any other section in the test.

## SECTION 6

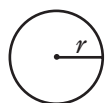
Time: 25 Minutes—Turn to Section 6 (page 764) of your answer sheet to answer the questions in this section.  
18 Questions

**Directions:** This section contains two types of questions. You have 25 minutes to complete both types. For questions 1–8, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

**Notes:**

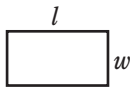
- The use of a calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- Unless otherwise specified, the domain of any function  $f$  is assumed to be the set of all real numbers  $x$  for which  $f(x)$  is a real number.

REFERENCE INFORMATION

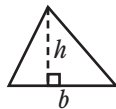


$$A = \pi r^2$$

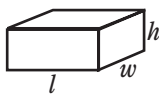
$$C = 2\pi r$$



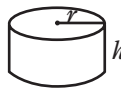
$$A = lw$$



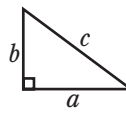
$$A = \frac{1}{2}bh$$



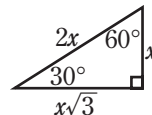
$$V = lwh$$



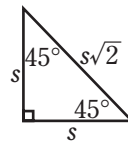
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



*Special Right Triangles*



The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

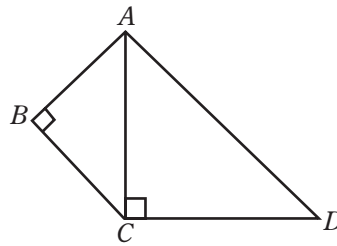
- From the equations  $7a = 4$  and  $7a + 4b = 12$ , one can conclude that  $b$  is
  - 1
  - 0
  - 1
  - 2
  - any integer
- How many values of  $x$  satisfy  $-\frac{1}{2} < \frac{x}{3} < -\frac{1}{4}$  where  $x$  is an integer?
  - none
  - one
  - two
  - three
  - infinitely many

GO ON TO THE NEXT PAGE



3. If  $r$  and  $s$  are negative numbers, then all of the following must be positive *except*

- (A)  $\frac{r}{s}$
- (B)  $rs$
- (C)  $(rs)^2$
- (D)  $r + s$
- (E)  $-r - s$



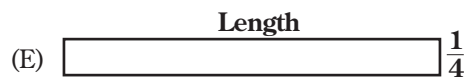
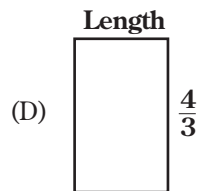
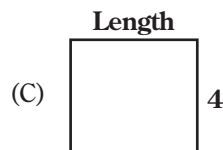
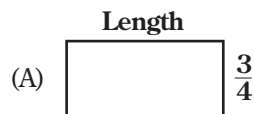
5. In the figure above,  $AB = BC$  and  $AC = CD$ . How many of the angles have a measure of 45 degrees?

- (A) none
- (B) two
- (C) three
- (D) four
- (E) five

4. If  $f(x) = x^2 + 2x + 1$ , then  $f(x - 1) =$

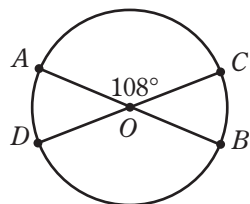
- (A)  $x^2 + 2x$
- (B) 0
- (C) 1
- (D)  $x^2$
- (E)  $2x + 1$

6. Which of the rectangles below has a length of  $\frac{4}{3}$ , if each has an area of 4?



*Note:* Figures are not drawn to scale.

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7.  $O$  is the center of a circle of diameter 20 and  $\angle AOC = 108^\circ$ . Find the sum of the lengths of minor arcs  $\widehat{AC}$  and  $\widehat{DB}$ .

- (A)  $5\pi$
- (B)  $8\pi$
- (C)  $10\pi$
- (D)  $12\pi$
- (E)  $15\pi$

8. Which is true of the graphs  $y = 2x^2$  and  $y = -2x^2$ ?

- I. They have only one point in common.
  - II. The shapes of both are the same but one is right side up and the other is upside down.
  - III. They both represent linear functions.
- (A) I only
  - (B) II only
  - (C) III only
  - (D) I and II only
  - (E) I, II, and III

GO ON TO THE NEXT PAGE 

**Directions:** For Student-Produced Response questions 9–18, use the grids at the bottom of the answer sheet page on which you have answered questions 1–8.

Each of the remaining 10 questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratchwork.

Write answer in boxes. →

Grid in result. →

Answer:  $\frac{7}{12}$  or 7/12


Answer: 2.5

Answer: 201  
Either position is correct.

Fraction line

Decimal point

Note: You may start your answers in any column, space permitting. Columns not needed should be left blank.

- Mark no more than one oval in any column.
- Because the answer sheet will be machine-scored, **you will receive credit only if the ovals are filled in correctly.**
- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the ovals accurately.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- No question has a negative answer.
- **Mixed numbers** such as  $2\frac{1}{2}$  must be gridded as 2.5 or 5/2. (If  is gridded, it will be interpreted as  $\frac{21}{2}$ , not  $2\frac{1}{2}$ .)

- **Decimal Accuracy:** If you obtain a decimal answer, **enter the most accurate value the grid will accommodate.** For example, if you obtain an answer such as 0.6666..., you should record the result as .666 or .667. **Less accurate values such as .66 or .67 are not acceptable.**
- Acceptable ways to grid  $\frac{2}{3} = .6666\dots$

9. Sophie has 3 times as many jelly beans as Mia, and Riley has 18 times as many jelly beans as Mia. What is the ratio

$$\frac{\text{Riley's jelly beans}}{\text{Sophie's jelly beans}} = ?$$

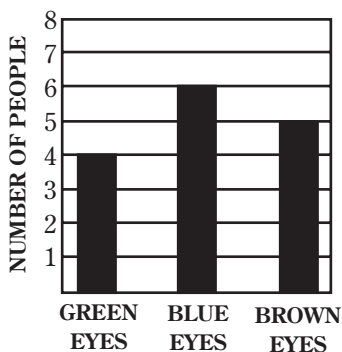
10. If two cubes have edges of 1 and 2, what is the sum of their volumes?

GO ON TO THE NEXT PAGE

11. If the numerical value of the binomial coefficient  $\binom{n}{2}$  is given by the formula  $\frac{n(n-1)}{2}$ , then what is the numerical value of  $\binom{15}{2}$ ?

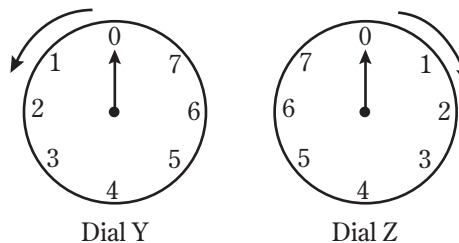
12. The letters  $r$  and  $s$  represent numbers satisfying  $r^2 = 9$  and  $s^2 = 25$ . What is the difference between the greatest possible values of  $s - r$  and  $r - s$ ?

13. According to the graph, what percent of the people in the group had brown eyes?



$$\begin{array}{r}
 N5 \\
 \times LM \\
 \hline
 385 \\
 385 \\
 \hline
 4,235
 \end{array}$$

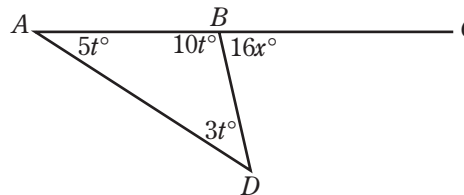
14. In the multiplication problem above,  $L$ ,  $M$ , and  $N$  each represent one of the digits 0 through 9. If the problem is computed correctly, find  $N$ .



15. In the figure above, the hand of dial Z moves in a clockwise direction. When its hand makes one complete revolution, it causes the hand of dial Y to move 1 number in the counterclockwise direction. How many complete revolutions of the hand of dial Z are needed to move the hand of dial Y 3 complete revolutions?

16. To make enough paste to hang 6 rolls of wallpaper, a  $\frac{1}{4}$  pound package of powder is mixed with  $2\frac{1}{2}$  quarts of water. How many pounds of powder are needed to make enough of the same mixture of paste to hang 21 rolls of paper?

17. On a mathematics test, the average score for a certain class was 90. If 40 percent of the class scored 100 and 10 percent scored 80, what was the average score for the remainder of the class?



18. In the figure above,  $ABC$  is a line segment. What is the value of  $x$ ?

**STOP**

If you finish before time is called, you may check your work on this section only.  
Do not turn to any other section in the test.

**Take a 5 minute break**  
before starting section 7

## SECTION 7

Time: 25 Minutes—Turn to Section 7 (page 764) of your answer sheet to answer the questions in this section.  
24 Questions

**Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

Example:

Hoping to \_\_\_\_\_ the dispute, negotiators proposed a compromise that they felt would be \_\_\_\_\_ to both labor and management.

- (A) enforce...useful
- (B) end...divisive
- (C) overcome...unattractive
- (D) extend...satisfactory
- (E) resolve...acceptable

A  B  C  D  E

1. The girl's extreme state of \_\_\_\_\_ aroused in him a feeling of pity.
  - (A) disapproval
  - (B) exultation
  - (C) enthusiasm
  - (D) degradation
  - (E) jubilation
  
2. Although our team was aware that the Raiders' attack power was \_\_\_\_\_ as compared with that of our players, we were stupid to be so \_\_\_\_\_.
  - (A) calculated...alert
  - (B) sluggish...easygoing
  - (C) acceptable...serious
  - (D) determined...detailed
  - (E) premeditated...willing
  
3. The \_\_\_\_\_ prime minister caused the downfall of the once \_\_\_\_\_ country.
  - (A) heroic...important
  - (B) respected...rich
  - (C) incompetent...powerful
  - (D) vacillating...confidential
  - (E) insightful...unconquerable
  
4. The main character in the novel was dignified and \_\_\_\_\_, a man of great reserve.
  - (A) garrulous
  - (B) aloof
  - (C) boring
  - (D) hypocritical
  - (E) interesting
  
5. The nonsmoker's blood contains \_\_\_\_\_ amounts of carbon monoxide; on the other hand, the smoker's blood contains \_\_\_\_\_ amounts.
  - (A) frequent...extensive
  - (B) heavy...adequate
  - (C) minute...excessive
  - (D) definite...puzzling
  - (E) bland...moderate

GO ON TO THE NEXT PAGE 

The two passages below are followed by questions based on their content and on the relationship between the two passages. Answer the questions on the basis of what is stated or implied in the passages and in any introductory material that may be provided.

**Questions 6–9 are based on the following passages.**

**Passage 1**

Classical music is termed “classical” because it can be heard over and over again without the listener tiring of the music. A symphony of Brahms can be heard and heard again with the same or even heightened enjoyment a few months  
5 later. It is unfortunate that the sales of classical music are dismal compared to other types of music. Perhaps this is because many people in our generation were not exposed to classical music at an early age and therefore did not get to know the music.

**Passage 2**

10 Contemporary nonclassical music has a high impact on the listener but unfortunately is not evergreen. Its enjoyment lasts only as long as there is current interest in the topic or emotion that the music portrays, and that only lasts for three months or so until other music replaces it,  
15 especially when another bestselling song comes out. The reason why the impact of this type of music is not as great when it first comes out is thought to be because technically the intricacy of the music is not high and not sophisticated, although many critics believe it is because the music elicits  
20 a particular emotional feeling that gradually becomes worn out in time.

6. According to the passage, it can be assumed that the majority of younger people do not like classical music because they
- (A) buy only the bestselling songs
  - (B) do not have the sophistication of a true music lover
  - (C) grow tired of classical music
  - (D) did not hear that type of music in their youth
  - (E) are more restless than the older generation

7. The reason that the enjoyment of a particular piece of contemporary music may not last as long as a piece of classical music is due to the
- (A) emotion of a person, which is thought to change in time
  - (B) high sophistication of the classical music and its technical intricacy
  - (C) fact that there is always another piece of contemporary music that replaces the one before it
  - (D) youth desiring something new
  - (E) economy and marketing of the songs
8. The term “evergreen” in line 11 most nearly means
- (A) colorful
  - (B) lasting
  - (C) current
  - (D) likeable
  - (E) encompassing
9. Which of the following is addressed in one passage but not the other?
- (A) The time period of enjoyment of the music
  - (B) The type of music
  - (C) A specific example illustrating a point
  - (D) The instruments used in the music
  - (E) The musicians playing the music

GO ON TO THE NEXT PAGE 

**Questions 10–15 are based on the following passage.**

*The following passage is excerpted from the Brahmin's life, Siddhartha.*

Siddhartha was now pleased with himself. He could have dwelt for a long time yet in that soft, well-upholstered hell, if this had not happened, this moment of complete hopelessness and despair and the tense moment when he was ready  
5 to commit suicide. Was it not his Self, his small, fearful and proud Self, with which he had wrestled for many years, which had always conquered him again and again, which robbed him of happiness and filled him with fear?

Siddhartha now realized why he had struggled in vain  
10 with this Self when he was a Brahmin and an ascetic. Too much knowledge had hindered him; too many holy verses, too many sacrificial rites, too much mortification of the flesh, too much doing and striving. He had been full of arrogance; he had always been the cleverest, the most eager—always a  
15 step ahead of the others, always the learned and intellectual one, always the priest or the sage. His Self had crawled into his priesthood, into this arrogance, into this intellectuality. It sat there tightly and grew, while he thought he was destroying it by fasting and penitence. Now he understood  
20 it and realized that the inward voice had been right, that no teacher could have brought him salvation. That was why he had to go into the world, to lose himself in power, women and money; that was why he had to be a merchant, a dice player, a drinker and a man of property, until the priest and  
25 Samana in him were dead. That was why he had to undergo those horrible years, suffer nausea, learn the lesson of the madness of an empty, futile life till the end, till he reached bitter despair, so that Siddhartha the pleasure-monger and Siddhartha the man of property could die. He had died  
30 and a new Siddhartha had awakened from his sleep. He also would grow old and die. Siddhartha was transitory, all forms were transitory, but today he was young, he was a child—the new Siddhartha—and he was very happy.

These thoughts passed through his mind. Smiling, he  
35 listened thankfully to a humming bee. Happily he looked into the flowing river. Never had a river attracted him as much as this one. Never had he found the voice and appearance of flowing water so beautiful. It seemed to him as if the river had something special to tell him, something  
40 which he did not know, something which still awaited him. The new Siddhartha felt a deep love for this flowing water and decided that he would not leave it again so quickly.

10. The “soft, well-upholstered hell” (line 2) is a reference to
- (A) an attractive yet uncomfortable dwelling where Siddhartha resided
  - (B) Siddhartha’s lifestyle, which made him an unhappy person
  - (C) a place to which Siddhartha went when he wished to be completely by himself
  - (D) Siddhartha’s abode in a previous life not referred to in the passage
  - (E) a figment of Siddhartha’s imagination that used to haunt him
11. Which of the following best describes the relation between the second and third paragraphs?
- (A) Paragraph 3 shows how much happier one can be by living alone than in living with others, as brought out in paragraph 2.
  - (B) Paragraph 3 discusses the advantages of a simple life as opposed to the more complicated lifestyle discussed in paragraph 2.
  - (C) Paragraph 3 contrasts the life of a person without wealth and a formal religion with a person who has wealth and a formal religion, as in paragraph 2.
  - (D) Paragraph 3 demonstrates the happiness that can come as a result of giving up the power and the worldly pleasures referred to in paragraph 2.
  - (E) Paragraph 3 generalizes about the specific points made in paragraph 2.
12. Which of the following questions does the passage answer?
- (A) What is the meaning of a Brahmin?
  - (B) Why did Siddhartha decide to commit suicide?
  - (C) Where did Siddhartha own property?
  - (D) For how many years was Siddhartha a member of the priesthood?
  - (E) Where did Siddhartha go to school?
13. The word “transitory” in line 31 most likely means
- (A) quick on one’s feet
  - (B) invisible
  - (C) short-lived
  - (D) going from one place to another
  - (E) frozen

14. Which statement best expresses the main idea of this passage?
- (A) Arrogance constitutes a great hindrance for one who seeks to lead a peaceful life.
  - (B) One has to discipline himself so that he will refrain from seeking pleasures that will prove harmful later.
  - (C) The quest for knowledge is commendable provided that search has its limitations.
  - (D) There is a voice within a person that can advise him how to attain contentment.
  - (E) Peace and quiet are more important than wealth and power in bringing happiness.
15. What is the meaning of “Self,” as it is referred to in the passage?
- (A) one’s love of nature
  - (B) one’s own lifestyle
  - (C) one’s inner voice
  - (D) one’s remembrances
  - (E) one’s own interests



GO ON TO THE NEXT PAGE



**Questions 16–24 are based on the following passage.**

*The following passage explores how brilliant people think, how they may come up with their theories, and what motivates their thinking and creativity.*

The discoveries made by scientific geniuses, from Archimedes through Einstein, have repeatedly revolutionized both our world and the way we see it. Yet no one really knows how the mind of a genius works. Most people think that a very high IQ sets the great scientist apart. They assume that flashes of profound insight like Einstein's are the product of mental processes so arcane that they must be inaccessible to more ordinary minds.

But a growing number of researchers in psychology, psychiatry, and the history of science are investigating the way geniuses think. The researchers are beginning to give us tantalizing glimpses of the mental universe that can produce the discoveries of an Einstein, an Edison, a Da Vinci—or any Nobel Prize winner.

Surprisingly, most researchers agree that the important variable in genius is not the IQ but creativity. Testers start with 135 as the beginning of the “genius” category, but the researchers seem to feel that, while an IQ above a certain point—about 120—is very helpful for a scientist, having an IQ that goes much higher is not crucial for producing a work of genius. All human beings have at least four types of intelligence. The great scientist possesses the ability to move back and forth among them—the logical-mathematical, the spatial, which includes visual perception, the linguistic, and the bodily kinesthetic.

Some corroboration of these categories comes from the reports of scientists who describe thought processes centered on images, sensations, or words. Einstein reported a special “feeling at the tips of the fingers” that told him which path to take through a problem. The idea for a self-starting electric motor came to Nikola Tesla one evening as he was reciting a poem by Goethe and watching a sunset. Suddenly he imagined a magnetic field rapidly rotating inside a circle of electromagnets.

Some IQ tests predict fairly accurately how well a person will do in school and how quickly he or she will master knowledge, but genius involves more than knowledge. The genius has the capacity to leap significantly beyond his present knowledge and produce something new. To do this, he sees the relationship between facts or pieces of information in a new or unusual way.

The scientist solves a problem by shifting from one intelligence to another, although the logical-mathematical intelligence is dominant. Creative individuals seem to be marked by a special fluidity of mind. They may be able to think of a problem verbally, logically, and also spatially.

Paradoxically, fluid thinking may be connected to another generally agreed-upon trait of the scientific genius—persistence, or unusually strong motivation to work on a problem. Persistence kept Einstein looking for the solution to the question of the relationship between the law of gravity and his special theory of relativity. Yet surely creative fluidity enabled him to come up with a whole new field that included both special relativity and gravitation.

55 Many scientists have the ability to stick with a problem even when they appear not to be working on it. Werner Heisenberg discovered quantum mechanics one night during a vacation he had taken to recuperate from the mental jumble he had fallen into trying to solve the atomic-  
60 spectra problem.

16. Which statement is true, according to the passage?

- (A) The law of gravity followed the publication of Einstein's theory of relativity.
- (B) Nikola Tesla learned about magnets from his research of the works of Goethe.
- (C) Archimedes and Einstein lived in the same century.
- (D) Most scientists have IQ scores above 120.
- (E) We ought to refer to intelligences rather than to intelligence.

17. The author believes that, among the four intelligences he cites, the most important one for the scientist is

- (A) spatial
- (B) bodily kinesthetic
- (C) linguistic
- (D) logical-mathematical
- (E) not singled out

18. The author focuses on the circumstances surrounding the work of great scientists in order to show that

- (A) scientific geniuses are usually eccentric in their behavior
- (B) the various types of intelligence have come into play during their work
- (C) scientists often give the impression that they are relaxing when they are really working on a problem
- (D) scientists must be happy to do their best work
- (E) great scientific discoveries are almost always accidental

19. The passage can best be described as

- (A) a comparison of how the average individual and the great scientist think
- (B) an account of the unexpected things that led to great discoveries by scientists
- (C) an explanation of the way scientific geniuses really think
- (D) a criticism of intelligence tests as they are given today
- (E) a lesson clarifying scientific concepts such as quantum mechanics and relativity

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20. The passage suggests that a college football star who is majoring in literature is quite likely to have which intelligences to a high degree?
- I. logical-mathematical
  - II. spatial
  - III. linguistic
  - IV. bodily kinesthetic
- (A) I only  
(B) II only  
(C) III only  
(D) I, II, and III only  
(E) II, III, and IV only
21. Which statement would the author most likely *not* agree with?
- (A) Most people believe that IQ is what makes the scientist brilliant.  
(B) Some scientists may come up with a solution to a problem when they are working on something else.  
(C) Creativity is much more important than basic intelligence in scientific discovery.  
(D) Scientists and artists may think alike in their creative mode.  
(E) Scientists usually get the answer to a problem fairly quickly, and if they get stuck they usually go on to another problem.
22. “Fluidity” as described in lines 52–54 can best be defined as
- (A) persistence when faced with a problem  
(B) having a flighty attitude in dealing with scientific problems  
(C) being able to move from one scientific area to another  
(D) having an open mind in dealing with scientific phenomena  
(E) being able to generate enormous excitement in the scientist’s work
23. The word “paradoxically” in line 47 means
- (A) ironically  
(B) seemingly contradictorily  
(C) in a manner of speaking  
(D) experimentally  
(E) conditionally
24. The author’s attitude toward scientists in this passage can be seen as one of
- (A) objective intrigue  
(B) grudging admiration  
(C) subtle jealousy  
(D) growing impatience  
(E) boundless enthusiasm

**STOP**

If you finish before time is called, you may check your work on this section only.  
Do not turn to any other section in the test.

## SECTION 8

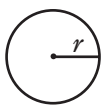
Time: 20 Minutes—Turn to Section 8 (page 765) of your answer sheet to answer the questions in this section.  
16 Questions

**Directions:** For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

**Notes:**

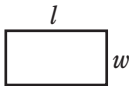
1. The use of a calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
4. Unless otherwise specified, the domain of any function  $f$  is assumed to be the set of all real numbers  $x$  for which  $f(x)$  is a real number.

REFERENCE INFORMATION

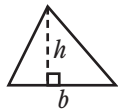


$$A = \pi r^2$$

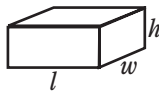
$$C = 2\pi r$$



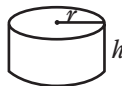
$$A = lw$$



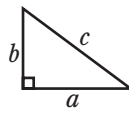
$$A = \frac{1}{2}bh$$



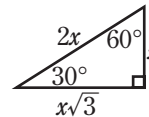
$$V = lwh$$



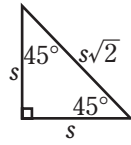
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



*Special Right Triangles*



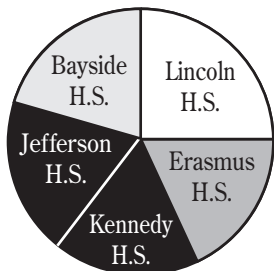
The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

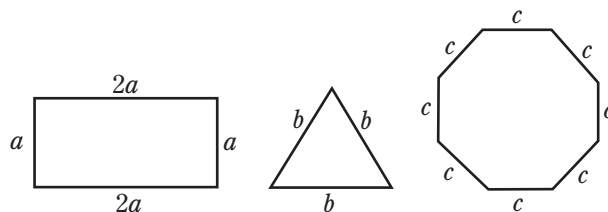
1. A box of candy contains 0.6 of a pound of caramels and 3.6 pounds of coconut. What percent of the contents of the box, by weight, consists of caramels?
  - (A) 6%
  - (B)  $14\frac{2}{7}\%$
  - (C)  $16\frac{2}{3}\%$
  - (D) 25%
  - (E)  $33\frac{1}{3}\%$

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Distribution of \$100,000 Land Improvement Funds to Five High Schools



2. The circle graph above describes the distribution of \$100,000 to five high schools for land improvement. Which high school received an amount closest to \$25,000?
- (A) Bayside H.S.
  - (B) Lincoln H.S.
  - (C) Erasmus H.S.
  - (D) Kennedy H.S.
  - (E) Jefferson H.S.



Note: Figures are not drawn to scale.

4. Which of the following is true if the three polygons above have equal perimeters?
- (A)  $b < a < c$
  - (B)  $a < c < b$
  - (C)  $a < b < c$
  - (D)  $c < b < a$
  - (E)  $c < a < b$

3. If  $y = r - 6$  and  $z = r + 5$ , which of the following is an expression representing  $r$  in terms of  $y$  and  $z$ ?
- (A)  $\frac{y + z + 1}{2}$
  - (B)  $\frac{y + z - 1}{2}$
  - (C)  $y + z - 1$
  - (D)  $y + z$
  - (E)  $y + z + 1$



5. A car travels from Town A to Town B in 3 hours. It travels from Town B to Town C in 5 hours. If the distance AB is equal to the distance BC, what is the ratio of the car's average speed between A and B to its average speed for the whole distance AC?
- (A) 5 : 3
  - (B) 4 : 3
  - (C) 1 : 1
  - (D) 1 : 3
  - (E) 1 : 5

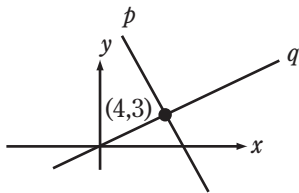
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6. Given that  $ax$  is an integer and  $bx$  is an integer, which of the following must also be an integer?

- I.  $a$  and  $b$
  - II.  $x$
  - III.  $(a + b)x$
- (A) None  
 (B) I only  
 (C) III only  
 (D) II and III only  
 (E) I, II, and III

8. The function  $f(x) = \frac{x-3}{2x+4}$  is not defined at

- I.  $x = 3$
  - II.  $x = 2$
  - III.  $x = -2$
- (A) I only  
 (B) II only  
 (C) III only  
 (D) I and II only  
 (E) I and III only



7. In the  $xy$ -coordinate system above, the lines  $q$  and  $p$  are perpendicular. The point  $(3, a)$  is on line  $p$ . What is the value of  $a$ ?

- (A) 3  
 (B) 4  
 (C)  $4\frac{1}{3}$   
 (D)  $4\frac{2}{3}$   
 (E)  $5\frac{1}{3}$

9. A sphere is inscribed in a cube whose volume is 64. What is the diameter of the sphere?

- (A) 2  
 (B)  $2\sqrt{2}$   
 (C) 8  
 (D)  $4\sqrt{2}$   
 (E) 4

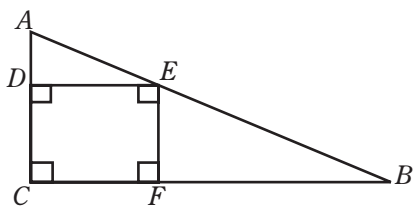
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10. If  $\frac{m}{n} = \frac{x}{m}$ , then  $x =$

- (A)  $\frac{m^2}{n}$   
 (B)  $\frac{m}{n}$   
 (C)  $\frac{n}{m^2}$   
 (D)  $\frac{1}{n}$   
 (E)  $n$

12. The number of boys in a certain class exceeds the number of girls by 7. If the number of boys is  $\frac{5}{4}$  of the number of girls, how many boys are there in the class?

- (A) 21  
 (B) 28  
 (C) 35  
 (D) 42  
 (E) 63



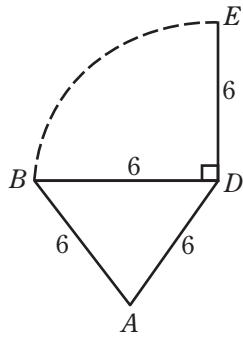
11. The rectangle  $CDEF$  has been inscribed in the right triangle  $ABC$ , as shown in the figure above. If  $CD = \frac{3}{4}AC$  and  $CF = \frac{2}{7}BC$ , what is the ratio of the area of  $\triangle ABC$  to the area of  $\square CDEF$ ?

- (A)  $\frac{14}{3}$   
 (B)  $\frac{7}{3}$   
 (C)  $\frac{7}{6}$   
 (D)  $\frac{1}{6}$   
 (E) The answer cannot be determined from the information given.

13. In 2009, the population of Smithdale was 900. Every year, the population of Smithdale had a net increase of 100. For example, in 2010, the population of Smithdale was 1,000. In which of the following periods was the percent increase in population of Smithdale the greatest?

- (A) 2009–2010  
 (B) 2010–2011  
 (C) 2011–2012  
 (D) 2012–2013  
 (E) The answer cannot be determined from the information given.

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14. Arc  $BE$  is a quarter circle with radius 6, and  $C$ , which is not shown, is an arbitrary point on arc  $BE$ . If  $AB = BD = AD = 6$ , then all of the possible values of the perimeter  $P$  of the quadrilateral  $ABCD$  are
- (A)  $P = 18$   
 (B)  $12 < P \leq 18$   
 (C)  $18 < P \leq 24$   
 (D)  $18 < P \leq 18 + 6\sqrt{2}$   
 (E)  $18 < P \leq 30$
15. If  $x > 0$  and  $y > 0$  and  $x^9 = 4$  and  $x^7 = \frac{9}{y^2}$ , which of the following is an expression for the value of  $x$  in terms of  $y$ ?
- (A)  $\frac{4}{9}y$   
 (B)  $\frac{2}{3}y$   
 (C)  $\frac{3}{2}y^2$   
 (D)  $6y$   
 (E)  $36y^2$
16. When Ethan received  $10x$  DVDs, he then had  $5y + 1$  times as many DVDs as he had originally. In terms of  $x$  and  $y$ , how many DVDs did Ethan have originally?
- (A)  $10x(5y + 1)$   
 (B)  $\frac{5y + 1}{10x}$   
 (C)  $\frac{2x}{y}$   
 (D)  $\frac{10}{5y + 1}$   
 (E) None of the above

**STOP**

If you finish before time is called, you may check your work on this section only.  
 Do not turn to any other section in the test.

## SECTION 9

Time: 20 Minutes—Turn to Section 9 (page 765) of your answer sheet to answer the questions in this section.  
19 Questions

**Directions:** For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

Example:

Hoping to \_\_\_\_\_ the dispute, negotiators proposed a compromise that they felt would be \_\_\_\_\_ to both labor and management.

- (A) enforce...useful
- (B) end...divisive
- (C) overcome...unattractive
- (D) extend...satisfactory
- (E) resolve...acceptable

A  B  C  D  E

1. As a truly objective person, Mr. Moy allows neither \_\_\_\_\_ attempts to please him nor open \_\_\_\_\_ on the part of his students to influence his marks.
  - (A) unearned...respect
  - (B) condescending...humor
  - (C) sincere...reliance
  - (D) backward...offense
  - (E) hypocritical...defiance
2. Because the subject matter was so technical, the instructor made every effort to use \_\_\_\_\_ terms to describe it.
  - (A) candid
  - (B) simplified
  - (C) discreet
  - (D) specialized
  - (E) involved
3. Violent crime has become so \_\_\_\_\_ in our cities that hardly a day goes by when we are not made aware of some \_\_\_\_\_ act on our local news broadcasts.
  - (A) scarce...momentous
  - (B) pervasive...benign
  - (C) conclusive...serious
  - (D) common...heinous
  - (E) ridiculous...unacceptable
4. Although they are \_\_\_\_\_ by intense police patrols, burglars \_\_\_\_\_ to prowl the subways.
  - (A) incited...decline
  - (B) enlivened...attempt
  - (C) hindered...cease
  - (D) persuaded...refuse
  - (E) impeded...continue
5. Britain's seizure of American ships and \_\_\_\_\_ of our sailors to serve in the British Navy were two major causes of the War of 1812.
  - (A) compelling
  - (B) recruiting
  - (C) bribing
  - (D) enlisting
  - (E) deriding
6. Since she had not worked very hard on her project, the student was quite \_\_\_\_\_ upon learning that she had won the contest.
  - (A) annoyed
  - (B) apathetic
  - (C) rebuffed
  - (D) dismayed
  - (E) elated

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The two passages below are followed by questions based on their content and on the relationship between the two passages. Answer the questions on the basis of what is stated or implied in the passages and in any introductory material that may be provided.

**Questions 7–19 are based on the following passages.**

*The following two passages are about science. The first describes science in general, and the second focuses on the subject of physics, one of the disciplines of science.*

**Passage 1**

Science, like everything else that man has created, exists, of course, to gratify certain human needs and desires. The fact that it has been steadily pursued for so many centuries, that it has attracted an ever-wider extent of attention, and that it is now the dominant intellectual interest of mankind, shows that it appeals to a very powerful and persistent group of appetites. It is not difficult to say what these appetites are, at least in their main divisions. Science is valued for its practical advantages, it is valued because it gratifies curiosity, and it is valued because it provides the imagination with objects of great aesthetic charm. This last consideration is of the least importance, so far as the layman is concerned, although it is probably the most important consideration of all to scientific men. It is quite obvious, on the other hand, that the bulk of mankind value science chiefly for the practical advantages it brings with it.

This conclusion is borne out by everything we know about the origin of science. Science seems to have come into existence merely for its bearings on practical life.

More than two thousand years before the beginning of the Christian era, both the Babylonians and the Egyptians were in possession of systematic methods of measuring space and time. They had a rudimentary geometry and a rudimentary astronomy. This rudimentary science arose to meet the practical needs of an agricultural population. Their geometry resulted from the measurements made necessary by the problems of land surveying. The cultivation of crops, dependent on the seasons, made a calendar almost a necessity. The day, as a unit of time, was, of course, imposed by nature. The movement of the moon conveniently provided another unit, the month, which was reckoned from one new moon to the next. Twelve of these months were taken to constitute a year, and the necessary adjustments were made from time to time by putting in extra months.

**Passage 2**

Let's be honest right at the start. Physics is neither particularly easy to comprehend nor easy to love, but then again, *what*—or for that matter, *who*—is? For most of us it is a new vision, a different way of understanding with its own scales, rhythms, and forms. And yet, as with *Macbeth*, *Mona Lisa*, or *La Traviata*, physics has its rewards. Surely you have already somehow prejudged this science. It's all too easy to compartmentalize our human experience: science in one box; and music, art, and literature in other boxes.

The Western mind delights in little boxes—life is easier to analyze when it's presented in small pieces in small compartments (we call it specialization). It is our traditional way of seeing the trees and missing the forest. The label on the box for physics too often reads "Caution: Not for Common Consumption" or "Free from Sentiment." If you can, please tear off that label and discard the box or we will certainly, sooner or later, bore each other to death. There is nothing more tedious than the endless debate between humanist and scientist on whose vision is truer; each of us is less for what we lack of the other.

It is pointless and even worse to separate physics from the body of all creative work, to pluck it out from history, to shear it from philosophy, and then to present it pristine, pure, all-knowing, and infallible. We know nothing of what will be with absolute certainty. There is no scientific tome of unassailable, immutable truth. Yet what little we do know about physics reveals an inspiring grandeur and intricate beauty.

7. The main idea of Passage 1 is that

- (A) science originated and developed because of the practical advantages it offers
- (B) the Egyptians and the Babylonians used scientific methods to meet the practical needs of feeding their people
- (C) the use of geometry and astronomy are very important for agricultural development
- (D) science has a different value for scientists than it does for the rest of the population
- (E) science is valued not only for its practical contributions to mankind but also for its potential to stir the imagination

8. According to Passage 1,

- (A) the Babylonians and the Egyptians were the first to use scientific methods
- (B) the Christians were the first to have a calendar
- (C) a 12-month calendar was first used by the Egyptians and Babylonians
- (D) the Christians preceded the Babylonians and Egyptians
- (E) scientists are probably more attracted to the charm of science than to its practical benefits

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9. The author of Passage 1 implies that scientists are generally
- (A) sociable
  - (B) imaginative
  - (C) practical
  - (D) philosophical
  - (E) arrogant
10. The word “rudimentary” in line 23 means
- (A) sophisticated
  - (B) flawed
  - (C) unworkable
  - (D) basic
  - (E) coarse
11. According to the author of Passage 2, what does the label on the box for physics suggest about physics?
- (A) It is a dangerous area of study.
  - (B) It is a cause for great excitement.
  - (C) It is uninteresting to the ordinary person.
  - (D) It is difficult to understand because it is completely subjective.
  - (E) It is a subject that should be elective but not required.
12. What statement does the author of Passage 2 make about physics?
- (A) It should be recognized for its unique beauty.
  - (B) It is a boring course of study.
  - (C) It appeals only to the Western mind.
  - (D) It is superior to music, art, and literature.
  - (E) It is unpopular with people who are romantic.
13. What is the main idea of Passage 2?
- (A) Scientists contribute more to mankind than do humanists.
  - (B) The Western mind is more precise than other minds.
  - (C) Complete vision needs both the scientist and the humanist.
  - (D) Humanists and scientists share no common ground.
  - (E) Physics is as important as other science.
14. In which manner does the author of Passage 2 address his audience?
- (A) affectionately
  - (B) arrogantly
  - (C) humorously
  - (D) cynically
  - (E) frankly
15. In line 47, the phrase “seeing the trees and missing the forest” means
- (A) putting experiences into categories
  - (B) viewing the world too narrowly
  - (C) analyzing scientific discoveries
  - (D) making judgments too hastily
  - (E) ignoring the beauty of natural surroundings
16. The author of Passage 2 leaves out an important aspect of the subject that is addressed in Passage 1. This aspect is the
- (A) reaction of laymen to physics
  - (B) specialization in science
  - (C) purity of physics
  - (D) practical applications of physics
  - (E) arguments between humanists and scientists
17. Which device or method does the author of Passage 2 use that is not used by the author of Passage 1?
- (A) analogy through objects
  - (B) critique
  - (C) contrast with respect to perceived values
  - (D) historical referencing
  - (E) examples to support a claim
18. Which subject is not directly mentioned in either passage?
- (A) agriculture
  - (B) astronomy
  - (C) art
  - (D) philosophy
  - (E) chemistry
19. The word “intricate” in line 61 means
- (A) eloquent
  - (B) complicated
  - (C) devastating
  - (D) uninteresting
  - (E) pointless

**STOP**

If you finish before time is called, you may check your work on this section only.  
Do not turn to any other section in the test.

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