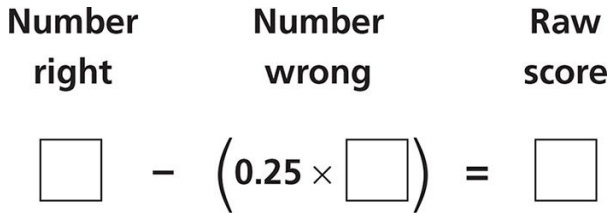
How to Calculate Your Score

Step 1: Figure out your raw score. Use the answer key to count the number of questions you answered correctly and the number of questions you answered incorrectly. (Do not count any questions you left blank.) Multiply the number wrong by 0.25 and subtract the result from the number correct. Round the result to the nearest whole number. This is your raw score.

SAT SUBJECT TEST: PHYSICS PRACTICE TEST 2



Step 2: Find your scaled score. In the Score Conversion Table below, find your raw score (rounded to the nearest whole number) in one of the columns to the left. The score directly to the right of that number will be your scaled score.

A note on your practice test scores: Don't take these scores too literally. Practice test conditions cannot precisely mirror real test conditions. Your actual SAT Subject Test: Physics score will almost certainly vary from your diagnostic and practice test scores. However, your scores on the diagnostic and practice tests will give you a rough idea of your range on the actual exam.

Raw	Scaled
75	800
74	800
73	800
72	800
71	800

70	800
69	800
68	800
67	800
66	800
65	800
64	800
63	800
62	790
61	790
60	780
59	780
58	770
57	770
56	760
55	760
54	750
53	750
52	740
51	730

50	730
49	720
48	720
47	710
46	700
45	700
44	690
43	690
42	680
41	670
40	670
39	660
38	650
37	650
36	640
35	640
34	630
33	630
32	620

31	610
30	610
29	600
28	600
27	590
26	580
25	580
24	570
23	570
22	560
21	550
20	540
19	540
18	530
17	530
16	520
15	510
14	510
13	500

12	490
11	480
10	480
9	470
8	470
7	460
6	450
5	450
4	440
3	430
2	430
1	420
0	410
–1	410
–2	400
–3	390
–4	390
–5	380
–6	370

–7	370
–8	360
–9	350
–10	350
–11	340
–12	330
–13	330
–14	320
–15	310
–16	310
–17	300
–18	290
–19	290

Score Conversion Table

Practice Test 2 Answer Grid

1.	A	B	C	D	E	26.	A	B	C	D	E	51.	A	B	C	D	E
2.	A	B	C	D	E	27.	A	B	C	D	E	52.	A	B	C	D	E
3.	A	B	C	D	E	28.	A	B	C	D	E	53.	A	B	C	D	E
4.	A	B	C	D	E	29.	A	B	C	D	E	54.	A	B	C	D	E
5.	A	B	C	D	E	30.	A	B	C	D	E	55.	A	B	C	D	E
6.	A	B	C	D	E	31.	A	B	C	D	E	56.	A	B	C	D	E
7.	A	B	C	D	E	32.	A	B	C	D	E	57.	A	B	C	D	E
8.	A	B	C	D	E	33.	A	B	C	D	E	58.	A	B	C	D	E
9.	A	B	C	D	E	34.	A	B	C	D	E	59.	A	B	C	D	E
10.	A	B	C	D	E	35.	A	B	C	D	E	60.	A	B	C	D	E
11.	A	B	C	D	E	36.	A	B	C	D	E	61.	A	B	C	D	E
12.	A	B	C	D	E	37.	A	B	C	D	E	62.	A	B	C	D	E
13.	A	B	C	D	E	38.	A	B	C	D	E	63.	A	B	C	D	E
14.	A	B	C	D	E	39.	A	B	C	D	E	64.	A	B	C	D	E
15.	A	B	C	D	E	40.	A	B	C	D	E	65.	A	B	C	D	E
16.	A	B	C	D	E	41.	A	B	C	D	E	66.	A	B	C	D	E
17.	A	B	C	D	E	42.	A	B	C	D	E	67.	A	B	C	D	E
18.	A	B	C	D	E	43.	A	B	C	D	E	68.	A	B	C	D	E
19.	A	B	C	D	E	44.	A	B	C	D	E	69.	A	B	C	D	E
20.	A	B	C	D	E	45.	A	B	C	D	E	70.	A	B	C	D	E
21.	A	B	C	D	E	46.	A	B	C	D	E	71.	A	B	C	D	E
22.	A	B	C	D	E	47.	A	B	C	D	E	72.	A	B	C	D	E
23.	A	B	C	D	E	48.	A	B	C	D	E	73.	A	B	C	D	E
24.	A	B	C	D	E	49.	A	B	C	D	E	74.	A	B	C	D	E
25.	A	B	C	D	E	50.	A	B	C	D	E	75.	A	B	C	D	E

Practice Test 2

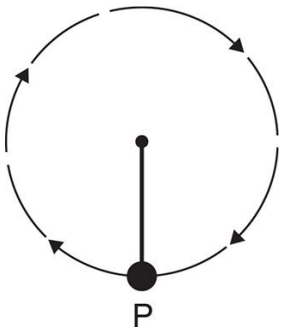
PART A

Directions

Each set of lettered choices below relates to the numbered questions immediately following it. Select the one lettered choice that best answers each question. A choice may be used once, more than once, or not at all in each set.

Questions 1–3 relate to the following.

A ball of mass *m* on the end of a string is swung clockwise in a horizontal circle at a constant radius *r*. When the ball is a point P as shown below, some of the choices that follow represent the directions of the vectors associated with the motion of the ball.



(A) 

(B) 

(C) 

(D) 

(E) 

1. What is the direction of the velocity of the ball at point P?

2. What is the direction of the acceleration of the ball at point P?

3. What is the direction of the net force acting on the ball at point P?

Questions 4–7 relate to the following series of images of a moving ball below.

Each image represents a time interval of one second, and the motion of the ball is not necessarily horizontal.

(A) 

(B) 

(C) 

(D) 

(E) 

4. In which of the choices above is the ball increasing its speed?

5. In which of the choices above is the ball moving at a constant velocity?

6. Which of the choices above could represent the ball being thrown upward before it begins falling back down?

7. Which of the choices above could represent the ball being rolled up an incline and then allowed to roll back down again?

Questions 8–10 relate to the following diagram of two charges, +Q and –4 Q.

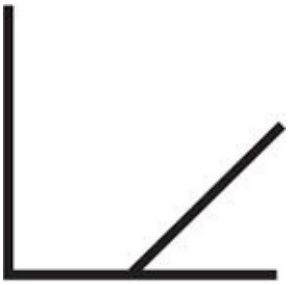
8. The net electric field is zero nearest which point?

9. At which point does the net electric field vector point to the left?

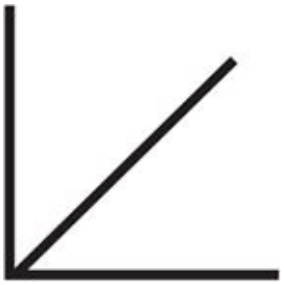
10. At which point would a small positive charge q feel the greatest force?

Questions 11–13 relate to the following graphs.

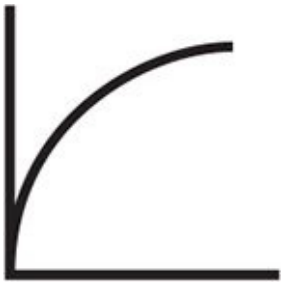
(A)



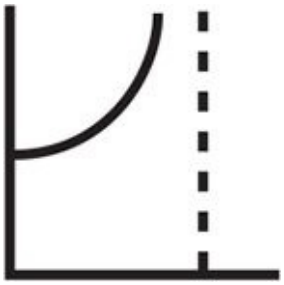
(B)



(C)



(D)



(E) 

11. Which of the graphs above represents the energy of a photon vs. its frequency?

12. Which of the graphs above represents the maximum kinetic energy of electrons emitted in the photoelectric effect vs. frequency of incoming light?

13. Which of the graphs above represents the mass of a relativistic particle vs. its speed?

PART B

Directions

Each of the questions or incomplete statements below is followed by five answer choices. Select the one that is best in each case.

Questions 14–15 refer to the following.

A red car and a blue car have the same mass and are moving on the highway. The red car is traveling at 60 miles per hour and the blue car is traveling at 30 miles per hour.

14. The ratio of the red car's momentum to the blue car's momentum is

(A) 4.

(B) 2.

(C) 1.

(D) $\frac{1}{2}$.

(E) $\frac{1}{4}$.

15. The ratio of the red car's kinetic energy to the blue car's kinetic energy is

(A) 4.

(B) 2.

(C) 1.

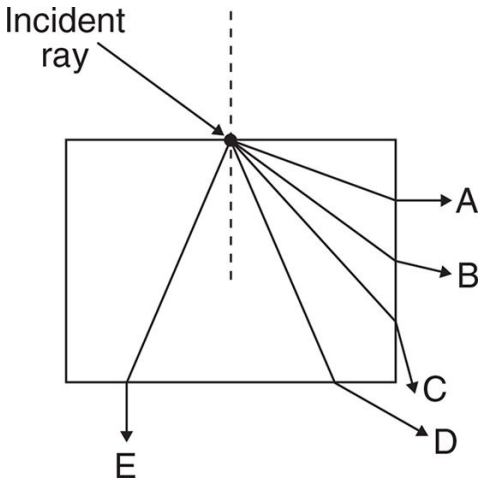
(D) $\frac{1}{2}$.

(E) $\frac{1}{4}$.

16. The waves on a lake cause a buoy to oscillate up and down 90 times per minute. The frequency of the waves in hertz is

(A) 90 Hz.
(B) 60 Hz.
(C) 1.5 Hz.
(D) 0.6 Hz.
(E) 0.67 Hz.

17.

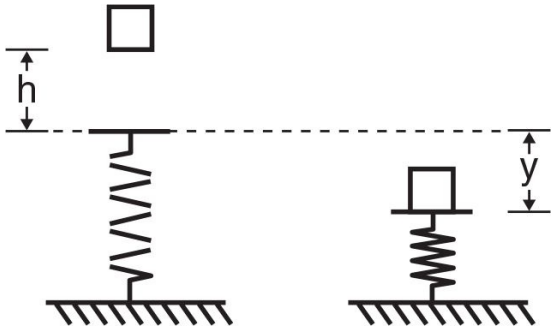


A ray of light passes through a piece of glass at the angle of incidence shown above. As the light passes through the glass and exits the glass into the air, the path of the ray is represented by which of the rays above?

(A) A
(B) B
(C) C
(D) D
(E) E

Questions 18–19 refer to the following.

A block falls onto a vertical spring from a height *h* and compresses the spring a distance *y*. Air resistance and friction may be neglected.



18. At the point of maximum compression, which of the following must be true?

(A) The speed of the block is maximum.
(B) The acceleration of the block is not zero.
(C) The potential energy of the block is zero.
(D) The kinetic energy of the block is maximum.
(E) The potential energy of the spring is zero.

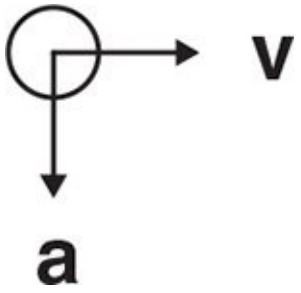
19. The spring expands upward and throws the block vertically back into the air. Which of the following is true after the block leaves the spring?

(A) The block has no kinetic energy.
(B) The block has no potential energy.
(C) The block will rise to exactly half the height from which it was dropped.
(D) The block reaches its maximum acceleration just after leaving the spring.
(E) The block will rise to the height from which it was dropped.

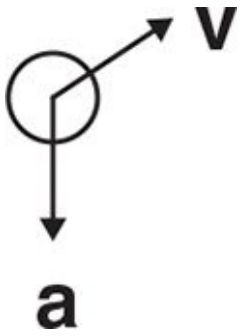
Questions 20–21 relate to the following.

The velocity and acceleration vectors associated with the motion of three particles are shown below.

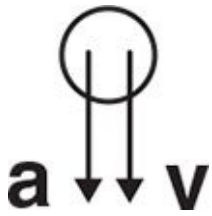
I.



II.



III.



20. Which of the above could represent the velocity and acceleration vectors for an object in uniform circular motion?

(A) I only
(B) II only
(C) III only
(D) I and II only

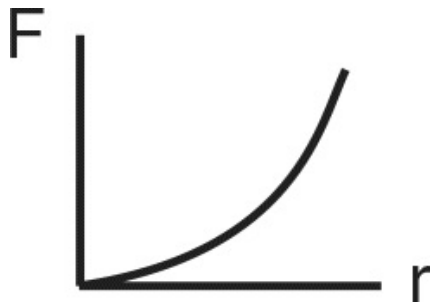
(E) II and III only

21. Which of the above could represent the velocity and acceleration vectors for a projectile following a parabolic path?

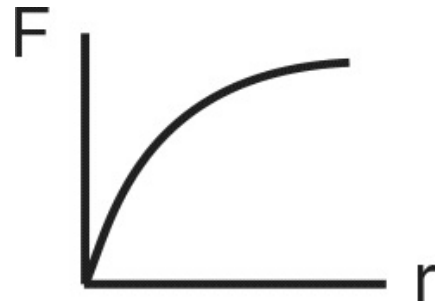
(A) I only
(B) II only
(C) III only
(D) I and II only
(E) II and III only

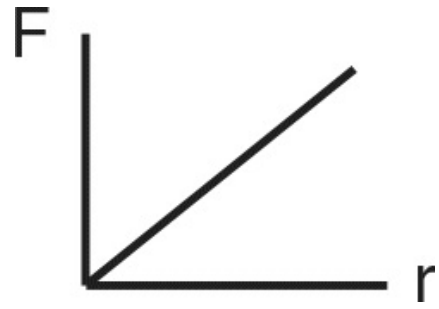
22. Two stars are separated by a distance *r* and are moving away from each other. Which of the graphs below best represents the gravitational force between the stars as a function of *r*, the distance between them?

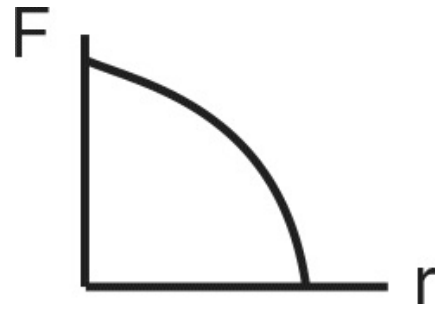
(A)



(B)

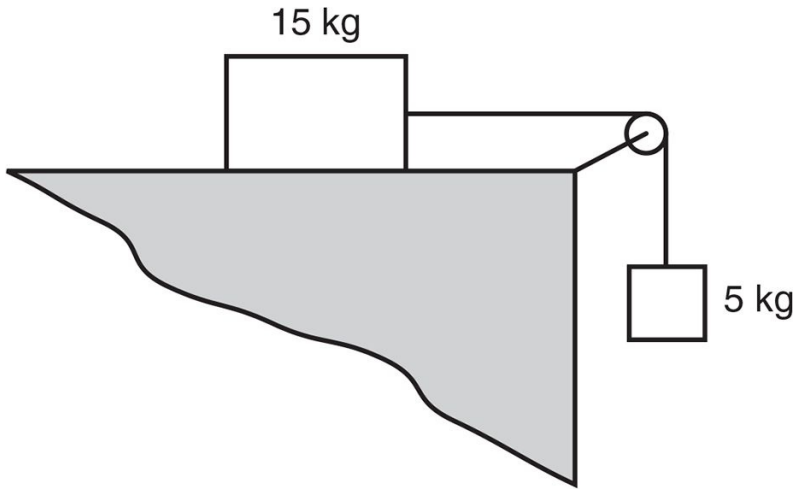
(C) 

(D) 

(E) 

Questions 23–24 refer to the following.

A 15 kg block rests on a surface of negligible friction and is pulled by a string that is passed over a pulley of negligible mass and connected to a hanging 5 kg block.



23. The net force acting on the 15 kg block is equal to

(A) the weight of the 5 kg block.
(B) the tension in the string.
(C) the difference between the weight of the 15 kg block and the 5 kg block.
(D) the sum of the weight of the 15 kg block and the 5 kg block.
(E) the weight of the 15 kg block.

24. In terms of the acceleration due to gravity g, the acceleration of the system is

(A) $\frac{g}{5}$.

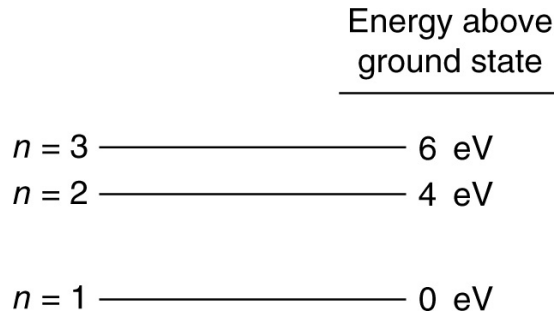
(B) $\frac{g}{4}$.

(C) $\frac{g}{3}$.

(D) g.

(E) 3 *g*.

25.



The energy levels above ground state for a hypothetical atom are shown above. What is the energy of a photon emitted as a result of an electron in this atom making a transition from the third energy level to the second energy level?

(A) 10 eV
(B) 6 eV
(C) 4 eV
(D) 2 eV
(E) 1 eV

26. Consider the three statements below.

I. The atom is mostly empty space.
II. Electrons orbit the nucleus of the atom.
III. The atom has a dense, positively charged nucleus.

Which of the above statements were conclusions drawn by Rutherford about the structure of the atom after studying the results of his alpha-

scattering experiment?

(A) I only
(B) II only
(C) I and II only
(D) II and III only
(E) I, II, and III

27. Which of the following colors of light has the lowest frequency?

(A) violet
(B) blue
(C) green
(D) yellow
(E) orange

28. A heat pump warms a house by absorbing 90 J of heat and doing 60 J of work on the pump. The heat then delivered to the house is

(A) 5,400 J.
(B) 150 J.
(C) 30 J.
(D) 1.5 J.
(E) 0.67 J.

Questions 29–30 relate to the following.

A resistor in a closed circuit has 2 A of current flowing through it and 12 volts across it.

29. The value of the resistor is

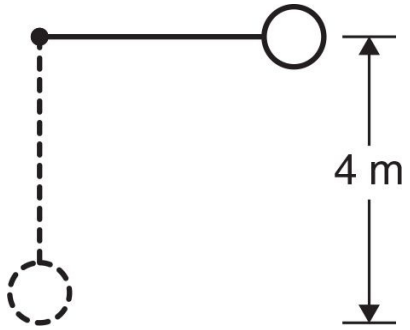
(A) 6 Ω.
(B) 10 Ω.
(C) 14 Ω.
(D) 24 Ω.
(E) 144 Ω.

30. The power dissipated in the resistor is

(A) 6 watts.
(B) 10 watts.
(C) 14 watts.
(D) 24 watts.
(E) 144 watts.

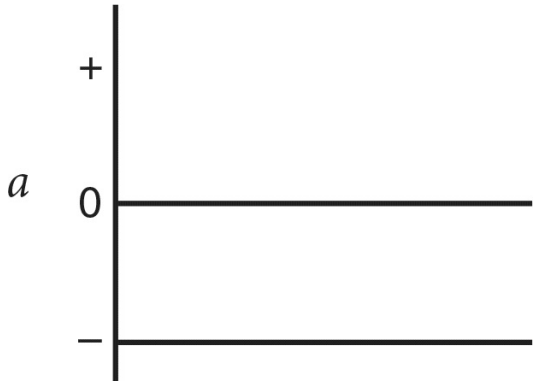
31. Which of the following is NOT a unit for energy?

(A) joule
(B) kilowatt-hour
(C) calorie
(D) watt
(E) eV

32. 

A pendulum is dropped from a height of 4 m as shown above. The speed of the pendulum at the lowest point in the swing is most nearly

(A) 6 m/s.
(B) 7 m/s.
(C) 8 m/s.
(D) 9 m/s.
(E) 10 m/s.

33. 

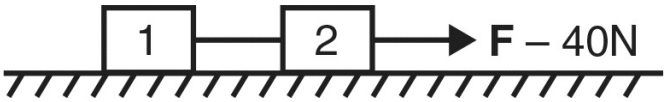
Consider the acceleration graph shown above and the following choices below.

I. A stone is falling toward the Earth.
II. A car is decreasing its speed.

III. A bicycle is rolling up a hill.

Which of the choices above could be represented by the acceleration vs. time graph?

(A) I only
(B) II only
(C) II and III only
(D) I and III only
(E) I, II, and III

34. 

Two blocks of equal mass are connected by a string. Block 2 is pulled by a force of 40 N, which accelerates both blocks at 3 m/s^2 along a surface of negligible friction. The tension in the string connecting the blocks is

(A) 120 N.
(B) 80 N.
(C) 40 N.
(D) 20 N.
(E) 13 N.

35. A ball dropped from a tower will strike the ground below in 3 s. If the ball is launched horizontally from the tower at a speed of 10 m/s, how far horizontally from the base of the tower will the ball land on the level ground?

(A) 100 m
(B) 45 m
(C) 30 m
(D) 10 m
(E) 3.3 m

36. A cluster of magnetically aligned atoms in a magnetic material is called a

(A) domain.
(B) molecule.
(C) pole.
(D) charge.
(E) electron cloud.

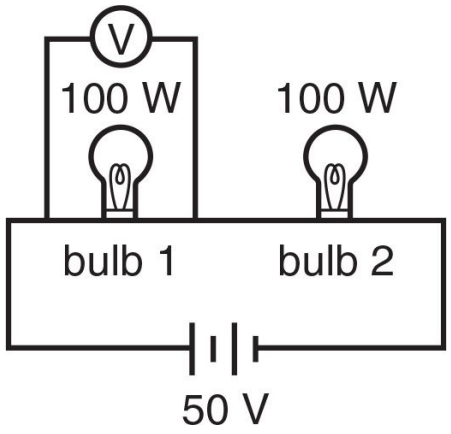
37. On the microscopic scale, friction is caused by which of the following fundamental forces?

(A) gravitational
(B) electrostatic
(C) strong nuclear
(D) weak nuclear
(E) proton and neutron

38. The time for one complete swing of a pendulum is called its period. The period of a pendulum for small swings near the Earth depends on its

(A) length and amplitude of swing only.
(B) amplitude of swing and mass only.
(C) length only.
(D) amplitude only.
(E) length, mass, and amplitude of swing.

Questions 39–41 refer to the circuit shown below.



A 50-volt battery supplies 100 w of power to each of the two identical light bulbs. The current passing through bulb 1 is 4 A.

39. The voltmeter across bulb 1 will read

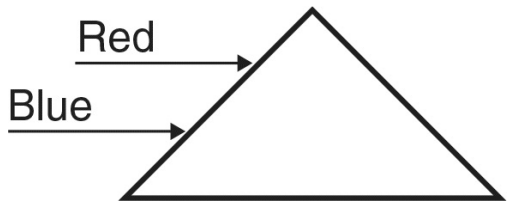
(A) 100 V.
(B) 50 V.
(C) 25 V.
(D) 4 V.
(E) zero.

40. The current through bulb 2 is

(A) 2 A.
(B) 4 A.
(C) 8 A.
(D) 100 A.
(E) zero.

41. The resistance of each bulb is most nearly

(A) 25 Ω.
(B) 20 Ω.
(C) 6 Ω.
(D) 4 Ω.
(E) 2 Ω.

42. 

Two beams of light, red and blue, enter a prism as shown above. Which of the following statements is true concerning the light as it passes through the prism?

(A) The blue light will bend more than the red light, since the blue light has a longer wavelength.
(B) The red light will bend more than the blue light, since the red light

has a longer wavelength.

(C) The blue light will bend more than the red light, since the blue light has a shorter wavelength.

(D) The red light will bend more than the blue light, since the red light has a shorter wavelength.

(E) The red and blue light will bend by the same amount, since all colors of light refract equally.

43. Green light is passed through two narrow slits and forms a pattern of bright and dark lines on a screen. The phenomena primarily responsible for this pattern is

(A) refraction.

(B) reflection.

(C) polarization.

(D) interference.

(E) intensity.

44. An ultraviolet photon has twice the frequency of a red photon. The ratio of the energy of the ultraviolet photon to the energy of the red photon is

(A) 4.

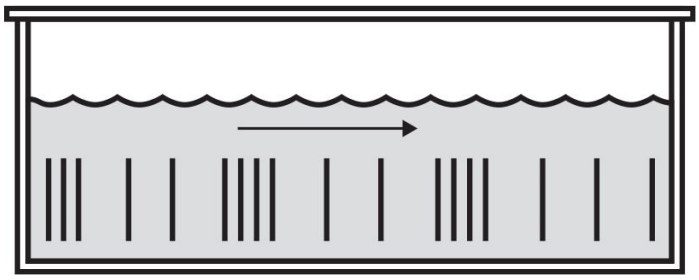
(B) 2.

(C) 1.

(D) $\frac{1}{2}$.

(E) $\frac{1}{4}$.

Questions 45–47 refer to the figure below, which represents a longitudinal wave moving through water in a glass tank of length 9 meters. The frequency of the wave is 500 Hz.



45. This wave could be which of the following types of waves?

(A) visible light
(B) radio wave
(C) microwave
(D) sound wave
(E) X-ray

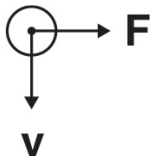
46. What is the wavelength of the longitudinal wave?

(A) 1.5 m
(B) 3 m
(C) 4.5 m

(D) 9 m
(E) 18 m

47. The speed of the wave is most nearly

(A) 500 m/s.
(B) 750 m/s.
(C) 1,500 m/s.
(D) 3,000 m/s.
(E) 4,500 m/s.

48. 

A ball is moving downward with a velocity **v** as shown in the figure above, with a force **F** directed to the right acting on the ball. Which of the statements is true?

(A) The ball is moving with a constant velocity.
(B) The ball is moving with a constant speed.
(C) The force **F** is doing work on the ball.
(D) The force **F** is changing the kinetic energy of the ball.
(E) The velocity and the acceleration of the ball are in the same direction.

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