 Name ____________________

$$x = x_i + vt + \frac{1}{2}at^2 \qquad v_f^2 = v_i^2 + 2ad \qquad v_f = v_i + at$$

$$w = mg \qquad F_g = \frac{Gm_1m_2}{r^2}$$

$$g = 9.8m/s^2 \qquad G = 6.67 \times 10^{11}(Nm^2/kg^2)$$

$$F = ma \qquad F_f = \mu N$$

$$\tau = Fr\sin\theta \qquad a_c = \frac{v^2}{r} \qquad F_c = \frac{mv^2}{r}$$

$$p = mv \qquad Impulse = F \times t$$

$$F \times t = \Delta(mv)$$

$$W = Fd \qquad P = \frac{W}{t}$$

$$Eff = \frac{Work_{out}}{Work_{in}} \qquad Eff = \frac{Power_{out}}{Power_{in}}$$

$$KE = \frac{1}{2}mv^2 \qquad PE = mgh \qquad PE = \frac{1}{2}kx^2$$

Academic Physics Midterm Name______________________________

1. The apparent shift in position of an object when it is viewed from various angles is called _____.
a. parallax **b.** margin of error **c.** calibration **d.** accuracy

2. A device with very small divisions on its scale can measure with _____.
a. scientific notation **b.** agreement **c.** precision **d.** fundamental units

3. An atomic mass unit is measured at 1.660 x 10^{27} kg, a number that has significant digits.
a. 1 **b.** 2 **c.** 3 **d.** 4

4. A comparison between an unknown quantity and a standard is referred to as a _____.
a. margin of error **b.** consistency **c.** measurement **d.** variables

5. _____ is a technique used to assure the accuracy of a measuring instrument.
a. Two-point calibration **c.** Analysis
b. Precision **d.** Dimension

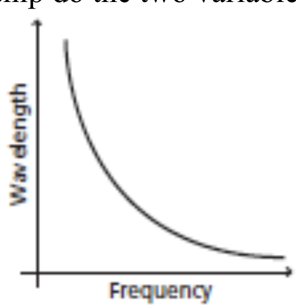
6. The degree of possible error in a measurement is called its _____.
a. fundamental unit **c.** precision balance
b. mechanical quantity **d.** margin of uncertainty

7. The slope of a straight-line graph is the rise _____ the run.
a. added to **b.** subtracted from **c.** multiplied by **d.** divided by

8. A line drawn as close as possible to all data points is called the _____.
a. linear relationship **c.** vertical value
b. line of best fit **d.** parabola

9. To calculate the weight of an object in newtons, N, Tamala multiplies its mass of 0.82 kg times the acceleration due to gravity (9.80 m/s2). Which answer expresses the weight of the object with the correct degree of precision?
a. 8 N **b.** 8.0 N **c.** 8.04 N **d.** 8.036 N

10. The graph shows the relationship between the frequency and wavelength of light waves. Which type of relationship do the two variables exhibit?



a. inverse **b.** linear **c.** parabolic **d.** quadratic

11. The length of the displacement vector represents how far an object _____.
a. can be thrown **c.** traveled in one direction
b. is visible **d.** can be stretched

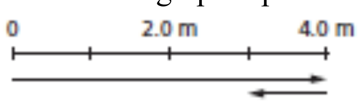
12. Position-time graphs can be used to find the _____ of an object, as well as where and when two objects meet.
a. velocity and position **b.** magnitude **c.** gravity **d.** time interval

13. The average speed is the _____ average velocity.
a. always slower than **c.** the indirect value of
b. the same as **d.** the absolute value of

14. The slope of an object's position-time graph is the _____ of the object's motion.
a. distance **c.** average velocity
b. displacement **d.** instantaneous velocity

15. An object's velocity is how fast it is moving and _____.
a. its initial position **c.** how far it has been
b. in what direction it is moving **d.** its instantaneous position

Use the graph to answer problems 16 and 17.
The lines on the graph represent displacement vectors for the route along which a person moves.

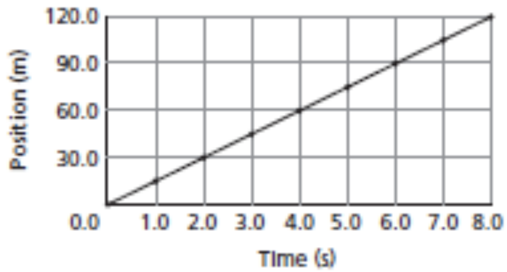


16. What is the total distance traveled?
a. 3.0 m **b.** 4.0 m **c.** 5.0 m **d.** 6.0 m

17. What is the person's displacement for the trip?
a. 0.0 m **b.** 3.0 m **c.** 4.0 m **d.** 5.0 m

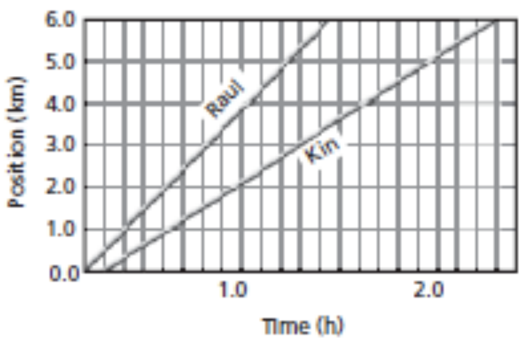
18. Which is a vector quantity?
a. distance **b.** position **c.** time **d.** velocity

19. The position-time graph represents part of a car trip along a straight road. What is the average velocity of the car for the first 8.0 s?



a. 20 m/s **b.** 15 m/s **c.** 12 m/s **d.** 8 m/s

20. The position-time graph represents two walkers. Which walker is the faster one? How do you know?



a. Raul, because according to the graph, he started first.
b. Kin, because his position-time graph looks longer.
c. Raul, because the slope of his position time is steeper, meaning he goes farther in a given time period.
d. Kin, because the area under his graph is greater.

21. A bus leaves the terminal and travels for 120 s at an average velocity of 10.0 m/s before it stops at its first destination. How far from the terminal is the first destination?
a. 10 m **b.** 12 m **c.** 120 m **d.** 1200 m

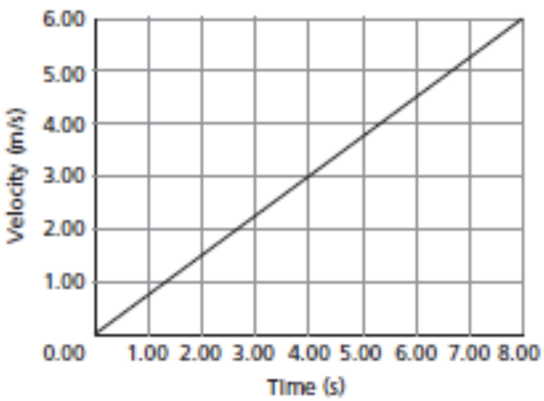
22. A bicyclist maintains a constant velocity of 4.0 m/s for a distance of 480 m. How long does it take the bicyclist to travel this distance?
a. 8 s **b.** 120 s **c.** 476 s **d.** 1920 s

23. When acceleration and velocity vectors are pointing in opposite directions, the object is _____.
a. speeding up **b.** slowing down **c.** moving at constant speed **d.** not moving

24. If a runner accelerates from 2 m/s to 3 m/s in 4 s, her average acceleration is _____.
a. 4.0 m/s^2 **b.** 2.5 m/s^2 **c.** 0.40 m/s^2 **d.** 0.25 m/s^2

25. The area under a velocity-time graph is equal to the object's _____.
a. stop time **b.** acceleration **c.** displacement **d.** average speed

26. The graph shows the velocity of a bicycle as the rider moves away from a curb.



Based on the slope of the graph, what is the average acceleration of the bicycle?
a. 6.00 m/s^2 **b.** 3.00 m/s^2 **c.** 1.33 m/s^2 **d.** 0.750 m/s^2

27. A car's velocity decreases from 22.0 m/s to 10.0 m/s over a period of 3.0 s. What is the car's average acceleration?
A -4.0 m/s^2 **B** -3.0 m/s^2 **C** 3.0 m/s^2 **D** 4.0 m/s^2

28. If a sprinter accelerates from rest at a constant rate of 2.0 m/s^2, how fast will she be running after 4.0 s?
a. 8.0 m/s **b.** 4.0 m/s **c.** 2.0 m/s **d.** 0.5 m/s

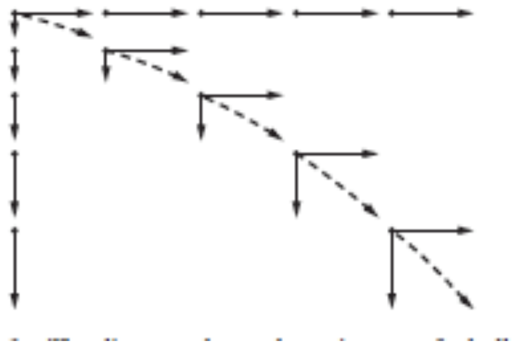
29. A graph shows position as a function of time for an object moving with constant acceleration. What does the slope of the graph represent?
a. acceleration **b.** displacement **c.** time **d.** velocity

30. A pebble falls from a bridge into the river below. If the pebble falls for 1.20 s, what is its velocity when it hits the water?
a. -8.17 m/s **b.** -8.40 m/s **c.** -11.0 m/s **d.** -11.8 m/s

31. A car with an initial displacement of 10.0 m and an initial velocity of 16.0 m/s accelerates at an average rate of 0.50 m/s^2 for 4.0 s. What is the car's displacement after 4.0 s?
a. 68 m **b.** 78 m **c.** 82 m **d.** 88 m

32. A racing cyclist is traveling at 19.3 km/h when she speeds up with a constant acceleration of 0.67 m/s^2. What is her velocity after 5.00 s?
a. 3.4 m/s^2 **b.** 31 km/h **c.** 23 km/h **d.** 140 m/s^2

Use the figure below to answer problems 33 and 34.



33. The diagram shows the trajectory of a ball that is thrown horizontally from the top of a building. The ball's vertical and horizontal velocity vectors, along with the resultant vectors, are also indicated. If the ball takes 3.0 s to reach the ground, how fast is it moving by the time it reaches the ground?
a. 9.8 m/s **b.** 29 m/s **c.** 58 m/s **d.** 60 m/s

34. If the ball's initial horizontal velocity is 1.9 m/s, how far from the building is the ball when it hits the ground?
a. 5.7 m **b.** 11.4 m **c.** 32 m **d.** 59 m

35. In a penalty kick, a soccer player kicks the ball from ground level with an initial velocity of 25.0 m/s, 20.0° above the horizontal. Assume that air resistance is negligible. What is the maximum height, y_{max}, of the soccer ball?
a. 0.510 m **b.** 3.18 m **c.** 3.73 m **d.** 8.55 m

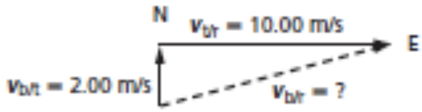
36. What is the flight time of the soccer ball in the previous problem?
a. 0.76 s **b.** 0.87 s c. 1.32 s **d.** 1.75 s

37. The cars on an amusement-park ride travel at a constant velocity of 4.0 m/s on a circular track that has a radius of 4.0 m. What is the magnitude of each car's centripetal acceleration?
a. 1.0 m/s^2 **b.** 2.0 m/s^2 **c.** 4.0 m/s^2 **d.** 16 m/s^2

38. If each car in the previous problem has a mass of 130.0 kg, what is the net centripetal force acting on each car?
a. 8.1 N **b.** 33 N **c.** 3.9 x 10^2 N **d.** 5.2 x 10^2 N

39. A clown in a circus act swings a 2.7-kg metal ball attached to a 72.0-cm nylon string in a horizontal circle above her head, making one revolution in 0.98 s. What is the tension force, F_T, exerted on the string by the ball?
a. 3.8 N **b.** 3.0 x 10^3 N **c.** 8.0 x 10^1 N **d.** 92 N

Use the figure below to answer problems 40 and 41.



40. The diagram shows vectors representing the velocity of a truck relative to the road, *v*t/r, and the velocity of a box sliding across the back of the truck relative to the truck, *v*b/t. What is the speed of the box relative to the road?

a. 8.00 m/s **b.** 10.2 m/s **c.** 12.0 m/s **d.** 20.0 m/s

41. What is the angle of the box's motion?

a. 9.80° east of north **b.** 10.3° east of north **c.** 10.6° north of east **d.** 11.3° north of east

42. Moving faster as you pedal your bicycle harder on a level road demonstrates Newton's _____ law.

a. first **b.** second **c.** third **d.** gravity

43. According to Newton's _____ law, an object with no net force acting on it remains at rest or in motion with a constant velocity.

a. first **b.** second **c.** third **d.** apple

44. If you push against a wall, the wall pushes back against you with _____ force.

a. no **b.** less **c.** equal **d.** more

45. An object is in equilibrium if _____.

a. it has no weight
b. the net force on it is zero
c. it is accelerating
d. only one force is acting on it

46. The resultant of a 20-N force acting on an object to the right and a 30-N force acting on the object to the left is _____.

a. 50 N
b. 10 N
c. 10 N acting to the left
d. 30 N acting to the right

47. The force of kinetic friction between a box sliding on a surface depends on the _____.

a. surface area of the box
b. speed of the box
c. normal force
d. force causing the motion

48. An object at rest on a horizontal surface has a weight of 200 N. In order to move the box a minimum force of 20 N is required. The coefficient of static friction is _____.

a. 10 **b.** 0.10 **c.** greater than 10 **d.** greater than 0.10

49. The coefficient of static friction is _____ the coefficient of kinetic friction.

a. less than **b.** more than **c.** equal to **d.** unrelated to

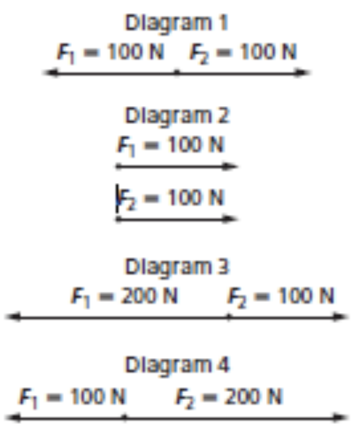
50. Two horizontal forces, one 180.0 N and the other 200.0 N, are exerted in opposite directions on a boat on a lake. What is the net horizontal force on the boat?
a. 380.0 N **b.** 200.0 N **c.** 180.0 N **d.** 20.0 N

51. Two dogs play tug-of-war with a rope toy that has a mass of 0.50 kg. If one dog pulls on the toy with a force of 140.0 N, and the other dog pulls in the opposite direction with a force of 138.0 N, what is the horizontal acceleration of the toy?
a. 9.8 m/s^2 **b.** 8.0 m/s^2 **c.** 4.9 m/s^2 **d.** 4.0 m/s^2

52. What is the force of gravity on a person who has a mass of 80.0 kg?
a. 176 N **b.** 686 N **c.** 784 N **d.** 801 N

53. A 60.0-kg boy rides in an elevator that accelerates upward at 1.80 m/s2. What is the net force exerted on the boy?
a. 9.8 N **b.** 108 N **c.** 480 N **d.** 588 N

54. The free-body diagrams below show four ways that two different forces could be exerted on an object.



In which diagram is the object in equilibrium?
a. Diagram 1 **b.** Diagram 2 **c.** Diagram 3 **d.** Diagram 4

55. Two teams, the Fifes and the Drums, are playing tug-of-war. Each team has 3 members. Both teams exert a force of 2002 N on the rope. The rope is not moving. What is the net force on the rope?
a. 0 N **b.** 333 N **c.** 2002 N **d.** 4004 N

56. Two people are paddling together in a canoe. Each exerts a horizontal force of 238 N toward the back of the canoe. What is the net horizontal force on the canoe?
a. 119 N **b.** 238 N **c.** 476 N **d.** 952 N

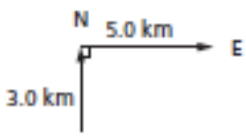
57. Refer to item **56** above. If the combined weight of the canoe and the two paddlers is 190 kg, what is the acceleration of the canoe?
a. 0.63 m/s^2 **b.** 1.3 m/s^2 **c.** 2.5 m/s^2 **d.** 5.0 m/s^2

Use the diagram to answer problems 58 and 59.

58. The figure shows a bucket hanging motionless from a rope. Assume that the rope has no mass. What is the net force on the bucket?
a. 0.0 N **b.** 2.0 N **c.** 9.8 N **d.** 2.0×10^1 N

59. What is the tension on the rope?
a. 9.8 N **b.** 10 N **c.** 14.2 N **d.** 20 N

60. The figure shows the displacement vectors of a car.



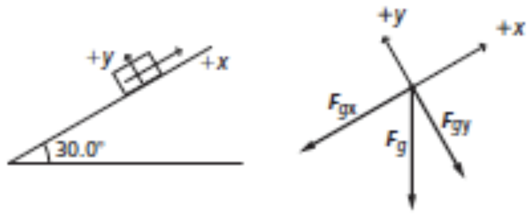
What is the magnitude of the resultant vector?
a. 2.0 km **b.** 2.8 km **c.** 4.0 km **d.** 5.8 km

61. If you exert 20.0 N of horizontal force while pushing a 10.2-kg box across the floor at a constant velocity, what is the coefficient of kinetic friction between the floor and the box?
a. 1.20 **b.** 0.800 **c.** 0.400 **d.** 0.200

62. The frictional force of a 2.0-kg block of wood on a wooden table is 3.8 N. If you push the block with a force of 11.8 N, what is its acceleration across the table?
a. 1.8 m/s^2 **b.** 2.0 m/s^2 **c.** 3.1 m/s^2 **d.** 4.0 m/s^2

63. A skier is at rest on a hill sloped at 40.0°. The coefficient of kinetic friction between the snow and the skis is 0.12. The skier starts skiing downhill. How fast is the skier going after 6.0 s?
a. 7.2 m/s **b.** 32 m/s **c.** 38 m/s **d.** 41 m/s

Use the diagram to answer problems 64 and 65.



64. The free-body diagram represents a 1.50-kg box resting on an inclined plane. What is the component of the weight parallel to the inclined plane?

a. -3.27 N **b.** -7.35 N **c.** -7.50 N **d.** -12.7 N

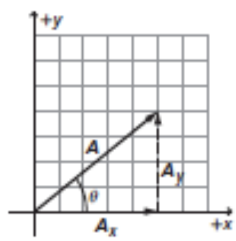
65. What is the component of the weight perpendicular to the inclined plane?

a. -3.27 N **b.** -5.66 N **c.** -7.35 N **d.** -12.7 N

66. Two vectors with lengths 1.00 m and 2.00 m have an angle, _ _ 30.0°, between them. What is the square of the length of the resultant vector?

a. 1.54 m^2 **b.** 3.00 m^2 **c.** 7.00 m^2 **d.** 8.46 m^2

67. The coordinate system below shows the components of vector ***A***. How is the direction of a vector, A, measured?



a. counterclockwise from the *y*-axis **b.** counterclockwise from the *y*-axis
c. counterclockwise from the *x*-axis **d.** clockwise from the *x*-axis

68. The horizontal and vertical components of a projectile's velocity are _____.

a. directly proportional **c.** independent of each other
b. inversely proportional **d.** equal

69. The horizontal acceleration of a projectile after it is fired is _____.

a. dependent on the vertical acceleration
b. directly proportional to acceleration due to gravity
c. constant
d. zero

70. Neglecting air resistance, the initial horizontal velocity of a projectile is _____ its final horizontal velocity.

a. greater than **c.** equal to
b. less than **d.** directly proportional to

71. An object in uniform circular motion has an acceleration that is _____.
a. in a direction tangential to the circle
b. toward the center of the circle
c. away from the center of the circle
d. zero

72. The velocity vector for an object in uniform circular motion is _____.
a. directed away from the center of the circle
b. directed toward the center of the circle
c. tangential to the circle
d. proportional to the radius of the circle

73. Newton found that the force of attraction between two masses is inversely proportional to the square of _____.
a. the distance between them
b. the sum of the masses
c. the product of the masses
d. the strength of the gravitational field

74. A planet has a mass of 8.4×10^{24} kg, which is about eight times the mass of its single moon. If the distance between the planet and the moon is about 4.2×10^{5} km, what is the gravitational pull of the planet on the moon?
a. 3.3×10^{21} N **b.** 2.1×10^{23} N **c.** 3.3×10^{27} N **d.** 2.1×10^{29} N

75. An increase in the strength of the gravitational field surrounding an object results from an increase in its _____.
a. orbit **b.** mass **c.** density **d.** radius

76. Impulse equals _____.
a. instantaneous momentum
b. mass times velocity
c. the difference in the final and initial momenta
d. the sum of forces acting on a body

77. On a force-time graph, the area under the graph is a measure of _____.
a. force **b.** impulse **c.** mass **d.** momentum

78. An air bag is effective because it _____ the amount of force by increasing the time interval over which it acts.
a. balances **b.** decreases **c.** eliminates **d.** increases

79. Ball A collides with ball B. The force ball A exerts on ball B _____ compared to the force ball B exerts on ball A.
a. is not equal in magnitude
b. is less in magnitude and opposite in direction
c. is equal in magnitude and opposite in direction
d. is equal in magnitude and acts in the same direction

80. In order for momentum to be conserved, the system must be _____.
a. both closed and isolated
b. either closed or isolated
c. closed but not isolated
d. isolated but not closed

81. A student on in-line skates is holding onto a grocery cart. She pushes the cart away from her. The resulting backward movement of the skater is an example of _____.
a. force **b.** isolation **c.** propulsion **d.** recoil

82. One billiard ball strikes another billiard ball, and they move away from each other at a 60° angle. The momenta involved include _____ of the velocity before and after the collision.
a. only the direction
b. only the magnitude
c. the magnitude and direction
d. the square of the magnitude

83. One definition of _____ is "work done per unit time."
a. efficiency
b. ideal mechanical advantage
c. mechanical advantage
d. power

84. An ideal machine has an ideal mechanical advantage that is _____ the displacement of the effort force divided by the displacement of the load.
a. close to **b.** equal to **c.** greater than **d.** less than

85. For an ideal machine, efficiency is always _____100 percent.
a. close to **b.** equal to **c.** greater than **d.** less than

86. Work is done on an object when a constant force is exerted on the object causing the object to be displaced _____.
a. opposite the direction of the force
b. at an angle to the force
c. perpendicular to the force
d. in the direction of the force

87. Which of the following items relates to power but not to work?
a. distance **b.** force **c.** mass **d.** time

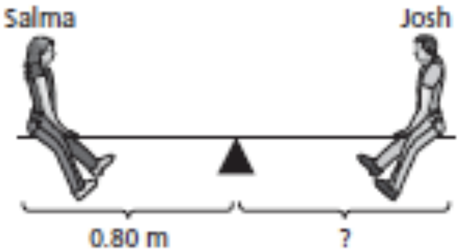
88. A 6 kg ball is traveling at 5 m/s. What is its kinetic energy?
a. 37.5 J **b.** 75 J **c.** 150 J **d.** 300 J

89. A ball of mass 0.5 kg has 100 J of kinetic energy. What is the velocity of the ball?
a. 20 m/s **b.** 40 m/s **c.** 100 m/s **d.** 400 m/s

90. A ball traveling at 30 m/s has 900 J of kinetic energy. What is the mass of the ball?
a. 1 kg **b.** 2 kg **c.** 9 kg **d.** 30 kg

91. Jorge tightens a bolt on his bicycle with a wrench that is 0.20 m long. If he pulls perpendicularly on the end of the wrench with a force of 140 N, how much torque does he apply?
a. 2.8 N·m **b.** 5.6 N·m **c.** 14 N·m **d.** 28 N·m

Use the figure below to answer problems 92 and 93.



92. Salma, who has a mass of 42 kg, and Josh, who has a mass of 45 kg, are trying to balance a seesaw. Salma's position is shown in the diagram. How far should Josh sit from the pivot point to balance Salma?
a. 0.86 m **b.** 0.80 m **c.** 0.75 m **d.** 0.72 m

93. Given Josh's distance from the pivot point in order to balance Salma, what must be his moment of inertia?
a. 25 kgm^2 **b.** 27 kgm^2 **c.** 29 kgm^2 **d.** 110 kgm^2

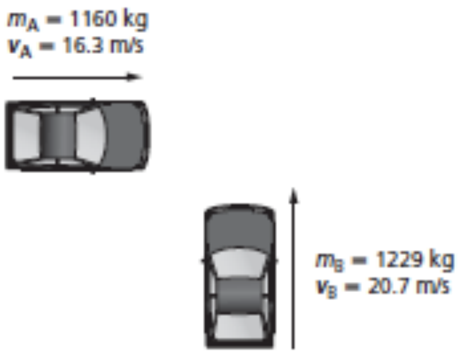
94. Two skaters, Elena and Tara, face each other on the ice. Elena has a mass of 57.4 kg, and Tara has a mass of 48.3 kg. Both are motionless until they push away with a force of 33 N. Then Elena has a velocity of 1.4 m/s. What is Tara's velocity?
a. -1.7 m/s **b.** -2.0 m/s **c.** -2.4 m/s **d.** -2.8 m/s

95. A 0.068-kg ball strikes a wall with a velocity of 22.1 m/s. The wall stops the ball in 0.36 s. What force does the wall exert to stop the ball?
a. 2.4 N **b.** 4.2 N **c.** 5.3 N **d.** 12 N

96. A 945-kg car is moving along a straight highway with a velocity of 98 km/h. The driver applies the brakes and reduces the car's speed to 36 km/h in 8.5 s. What is the impulse on the car?
a. -1.9×10^3 Ns **b.** -6.9×10^3 Ns **c.** -1.6×10^4 Ns **d.** -3.4×10^4 Ns

97. A 2100-kg car is traveling at 25 m/s when it crashes into the rear end of a 1650-kg car traveling at 21 m/s in the same direction on ice. The two cars become stuck together and slide on the ice. How fast do the two cars move together immediately after the collision?
a. 23 m/s **b.** 22 m/s **c.** 21 m/s **d.** 18 m/s

Use the following diagram for problems 98 and 99.



98. The diagram shows a car traveling north colliding with a car traveling east. After the collision, the cars stick together and move off in another direction. What is the magnitude of the cars' final momentum?
a. 5.96 x 10^4 kgm/s **b.** 1.19 x 10^4 kgm/s **c.** 3.13 x 10^4 kgm/s **d.** 3.17 x 10^4 kgm/s

99. A child holds onto a string attached to a toy boat and exerts a force of 8.0 N to pull the boat a distance of 7.2 m along a straight shoreline. If the child holds the string at a 15.0° angle with the horizontal, how much work does she do on the toy boat?
a. 14 J **b.** 56 J **c.** 58 J **d.** 71 J

100. How much power would be developed if the work were done in 2.5 s?
a. 3.0 W **b.** 6.0 W **c**. 27 W **d.** 54 W

Question	Answer	Standard	
1	a	3.2.P.B7	
2	c	3.2.P.B7	
3	d	3.2.P.B7	
4	c	3.2.P.B7	
5	a	3.2.P.B7	
6	d	3.2.P.B7	
7	d	3.2.P.B7	
8	b	3.2.P.B7	
9	b	3.2.P.B6	
10	a	3.2.P.B7	
11	c	3.2.P.B1	
12	a	3.2.P.B1	
13	d	3.2.P.B1	
14	c	3.2.P.B1	
15	b	3.2.P.B1	
16	c	3.2.P.B1	
17	b	3.2.P.B1	
18	d	3.2.P.B1	
19	b	3.2.P.B1	
20	c	3.2.P.B1	
21	d	3.2.P.B1	
22	b	3.2.P.B1	
23	b	3.2.P.B1	
24	d	3.2.P.B1	
25	c	3.2.P.B1	
26	d	3.2.P.B1	
27	a	3.2.P.B1	

Question	Answer	Standard	
28	a	3.2.P.B1	
29	d	3.2.P.B1	
30	d	3.2.P.B1	
31	b	3.2.P.B1	
32	b	3.2.P.B1	
33	b	3.2.P.B1	
34	a	3.2.P.B1	
35	c	3.2.P.B1	
36	d	3.2.P.B1	
37	c	3.2.P.B1	
38	d	3.2.P.B6	
39	c	3.2.P.B6	
40	b	3.2.P.B6	
41	d	3.2.P.B6	
42	b	3.2.P.B6	
43	a	3.2.P.B6	
44	c	3.2.P.B6	
45	b	3.2.P.B6	
46	c	3.2.P.B6	
47	c	3.2.P.B6	
48	b	3.2.P.B6	
49	b	3.2.P.B6	
50	d	3.2.P.B6	
51	d	3.2.P.B7	
52	c	3.2.P.B6	
53	b	3.2.P.B6	
54	a	3.2.P.B7	
55	a	3.2.P.B6	
56	c	3.2.P.B6	

Question	Answer	Standard	
57	c	3.2.P.B1	
58	a	3.2.P.B6	
59	d	3.2.P.B6	
60	d	3.2.P.B7	
61	d	3.2.P.B6	
62	d	3.2.P.B6	
63	b	3.2.P.B1	
64	b	3.2.P.B6	
65	d	3.2.P.B7	
66	a	3.2.P.B6	
67	c	3.2.P.B6	
68	c	3.2.P.B7	
69	d	3.2.P.B6	
70	c	3.2.P.B1	
71	b	3.2.P.B1	
72	c	3.2.P.B1	
73	a	3.2.P.B1	
74	a	3.2.P.B2	
75	b	3.2.P.B2	
76	c	3.2.P.B2	
77	b	3.2.P.B2	
78	b	3.2.P.B2	
79	c	3.2.P.B2	
80	a	3.2.P.B2	
81	d	3.2.P.B2	
82	c	3.2.P.B2	
83	d	3.2.P.B2	
84	c	3.2.P.B2	
85	b	3.2.P.B2	

Question	Answer	Standard	
86	d	3.2.P.B2	
87	d	3.2.P.B2	
88	b	3.2.P.B2	
89	a	3.2.P.B2	
90	b	3.2.P.B2	
91	d	3.2.P.B2	
92	c	3.2.P.B2	
93	a	3.2.P.B2	
94	a	3.2.P.B2	
95	b	3.2.P.B2	
96	c	3.2.P.B2	
97	a	3.2.P.B2	
98	d	3.2.P.B2	
99	b	3.2.P.B2	
100	c	3.2.P.B2	