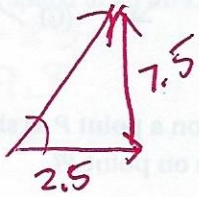
Spring Break Review

Multiple-Choice VECTORS

1. A vector is given by its components, $A_x = 2.5$ and $A_y = 7.5$. What angle does vector A make with the positive x-axis?



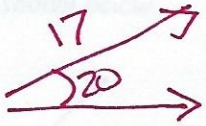
(A) 72°
(B) 18°
(C) 25°
(D) 50°

2. Which pair of vectors could produce a resultant of 35?

(A) 15 and 15
(B) 20 and 20
(C) 30 and 70
(D) 20 and 60

3. A vector has a magnitude of 17 units and makes an angle of 20° with the positive x-axis. The magnitude of the horizontal component of this vector is

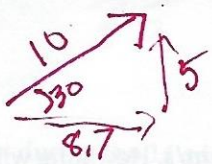
(A) 16 units
(B) 4.1 units
(C) 5.8 units
(D) 50 units

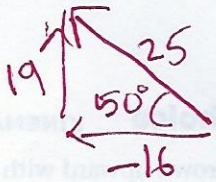


4. As the angle between a given vector and the horizontal axis increases from 0° to 90°, the magnitude of the vertical component of this vector

(A) decreases
(B) increases and then decreases
(C) decreases and then increases
(D) increases

5. Vector A has a magnitude of 10 units and makes an angle of 30° with the horizontal x-axis. Vector B has a magnitude of 25 units and makes an angle of 50° with the negative x-axis. What is the magnitude of the resultant between these two vectors?





(A) 20
(B) 35
(C) 15
(D) 25

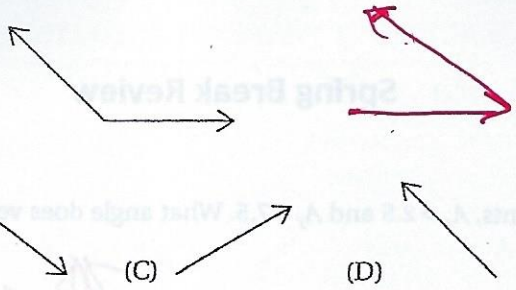
7. Which of the following sets of displacements have equal resultants when performed in the order given?

I: 6 m east, 9 m north, 12 m west
II: 6 m north, 9 m west, 12 m east
III: 6 m east, 12 m west, 9 m north
IV: 9 m north, 6 m east, 12 m west

9 V −6 H
6 V −3 H
9 V −6 H
9 V −6 H

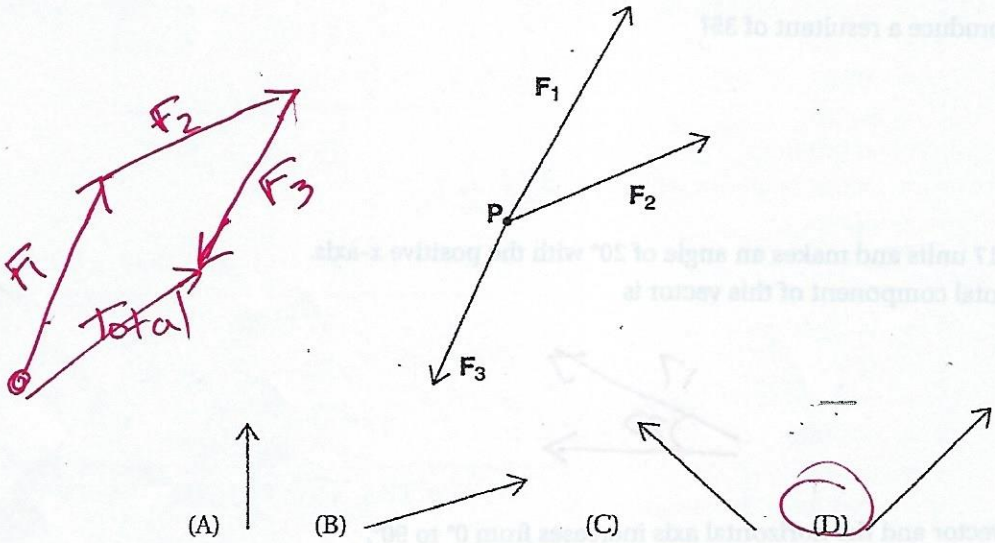
(A) I and IV
(B) I and II
(C) I, III, and IV
(D) I, II, IV

8. Which vector represents the direction of the two concurrent vectors shown below?



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

9. Three forces act concurrently on a point P as shown below. Which vector represents the direction of the resultant force on point P?



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

10. On a baseball field, first base is about 30 m away from home plate. A batter gets a "hit" and runs toward first base. She runs 3 m past the base and then runs back to stand on it. The magnitude of her final displacement from home plate is

(A) 27 m
(B) 30 m
(C) 33 m
(D) 36 m

Multiple-Choice KINEMATICS

1. A ball is thrown upward with an initial velocity of 20 m/s. How long will the ball take to reach its maximum height?

(A) 19.6 s
(B) 9.8 s
(C) 6.3 s
(D) 2.04 s

$v_0 = 20$
$v_1 = 0$
$v_1 = v_0 + gt$
$0 = 20 + (-9.8)t$

2. An airplane lands on a runway with a velocity of 150 m/s. How far will it travel until it stops if its rate of deceleration is constant at $-3\ m/s^2$?

(A) 525 m
(B) 3,750 m
(C) 6,235 m
(D) 9,813 m

$v_0 = 150$
$v_1 = 0$
$a = -3$

$v_1^2 = v_0^2 + 2ax$
$0 = 150^2 + 2(-3)x$

3. A ball is thrown downward from the top of a roof with a speed of 25 m/s. After 2 s, its velocity will be

(A) 19.6 m/s
(B) –5.4 m/s
(C) –44.6 m/s
(D) 44.6 m/s

$v_0 = -25$
$g = -9.8$
$t = 2$

$v_1 = v_0 + gt$
$v = -25 + (-9.8)(2)$

4. A rocket is propelled upward with an acceleration of 25 m/s^2 for 5 s. After that time, the engine is shut off, and the rocket continues to move upward. The maximum height, in meters, that the rocket will reach is

(A) 900
(B) 1,000
(C) 1,100
(D) 1,200

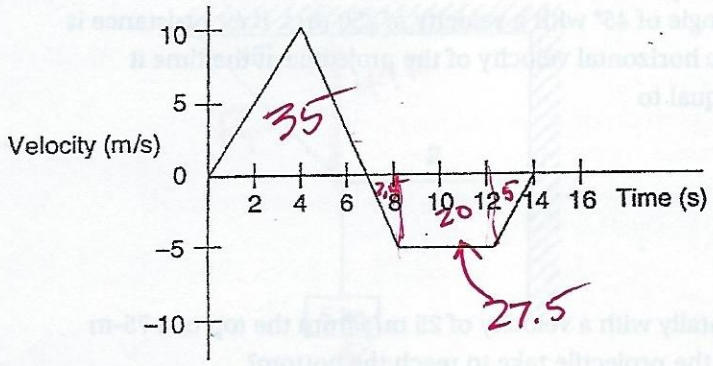
$v_0 = 0$
$v_1 = ?$
$a = 25$
$t = 5$

$x = v_0 t + \frac{1}{2}at^2$
$x = 0 + \frac{1}{2}(25)(5)^2 = 312m$

$v_1 = 0 + (25)(5)$
$v_1 = 125 m/s$

$v_0 = 125 m/s$
$v_1 = 0$
$g = -9.8$
$v_1^2 = v_0^2 + 2ax$
$0 = 125^2 + 2(-9.8)x$
$x = 797m$
$+ \ 312m$
$1100m$

Questions 5–7 refer to the velocity versus time graph shown below.



5. The total distance traveled by the object during the indicated 14 s is

(A) 7.5 m
(B) 25 m
(C) 62.5 m
(D) 77.5 m

$35 + 27.5$

6. The total displacement of the object during the 14 s indicated is

(A) 7.5 m
(B) 25 m
(C) 62.5 m
(D) 77.5 m

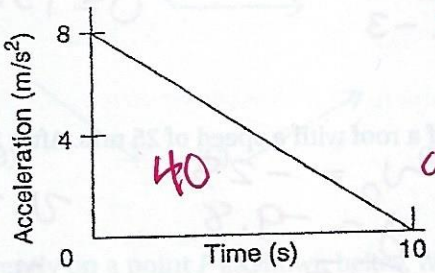
$35 - 27.5$

7. The average velocity, in meters per second, of the object is

(A) 0
(B) 0.5
(C) 2.5
(D) 4.5

$v = \frac{7.5\ m}{14\ s}$

8. What is the total change in velocity for the object whose acceleration versus time graph is given below?



40

area under curve is change in velocity

(A) 40 m/s
(B) –40 m/s
(C) 80 m/s
(D) –80 m/s

9. An object has an initial velocity of 15 m/s. How long must it accelerate at a constant rate of 3 m/s² before its average velocity is equal to twice its initial velocity?

(A) 5 s
(B) 10 s
(C) 15 s
(D) 20 s

$v_0 = 15 m/s$
$a = 3 m/s^2$
$v_1 = 45 m/s$
$45 = 15 + 3t$
$t = 10$ sec

$\bar{v} = \frac{v_0 + v_1}{2}$
$30 = \frac{15 + v_1}{2}$
$v_1 = 45 m/s$

10. A projectile is launched at an angle of 45° with a velocity of 250 m/s. If air resistance is neglected, the magnitude of the horizontal velocity of the projectile at the time it reaches maximum altitude is equal to

(A) 0 m/s
(B) 175 m/s
(C) 200 m/s
(D) 250 m/s

11. A projectile is launched horizontally with a velocity of 25 m/s from the top of a 75-m height. How many seconds will the projectile take to reach the bottom?

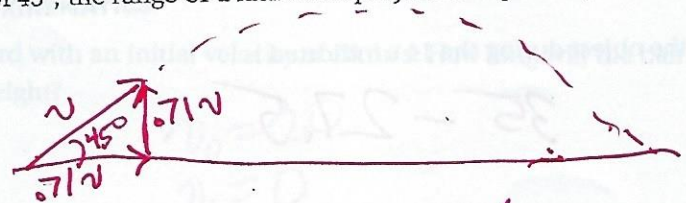
(A) 15.5
(B) 9.75
(C) 6.31
(D) 3.91

$y = -75 m$
$g = -9.8 m/s^2$
$t = ?$
$v_0 = 0$

$y = v_0 t + \frac{1}{2} g t^2$
$-75 = 0 + \frac{1}{2}(-9.8) t^2$

12. At a launch angle of 45°, the range of a launched projectile is given by

(A) $\frac{v_i^2}{g}$
(B) $\frac{2v_i^2}{g}$
(C) $\frac{v_i^2}{2g}$
(D) $\sqrt{\frac{v_i^2}{2g}}$

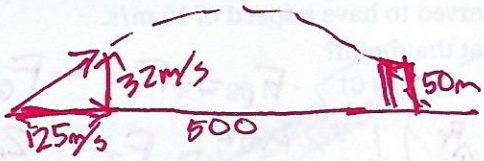


H	V
$v_x = .71v$	$v_0 = .71v$
$v_x = \frac{x}{t}$	g
$x = .71v\left(\frac{1.42v}{g}\right)$	$y = 0$
$x = \frac{v^2}{g}$	

$y = v_0 t + \frac{1}{2} g t^2$
$0 = .71vt + \frac{1}{2} g t^2$
$.71vt = \frac{1}{2} g t^2$
$.71v = \frac{g}{2} t$
$t = \frac{1.42}{g}$

13. A projectile is launched at a certain angle. After 4 s, it hits the top of a building 500 m away. The height of the building is 50 m. The projectile was launched at an angle of

(A) 14°
(B) 21°
(C) 37°
(D) 76°



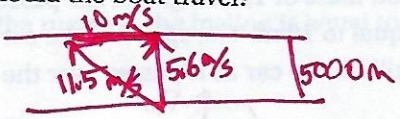
H
$v = 500\,m$
$t = 4\,s$
$v_x = 125\,m/s$

$y = 50\,m$
$t = 4\,s$
$g = -9.8\,m/s^2$
$v_0 = ?$

$y = v_0 t + \frac{1}{2} g t^2$
$50 = v_0(4) + \frac{1}{2}(-9.8)(4)^2$
$v_0 = 32\,m/s$

14. The operator of a boat wishes to cross a 5-km-wide river that is flowing to the east at 10 m/s. He wishes to reach the exact point on the opposite shore 15 min after starting. With what speed and in what direction should the boat travel?

(A) 11.2 m/s at 26.6° E of N
(B) 8.66 m/s at 63.4° W of N
(C) 11.4 m/s at 60.9° W of N
(D) 8.66 m/s at 26.6° E of N

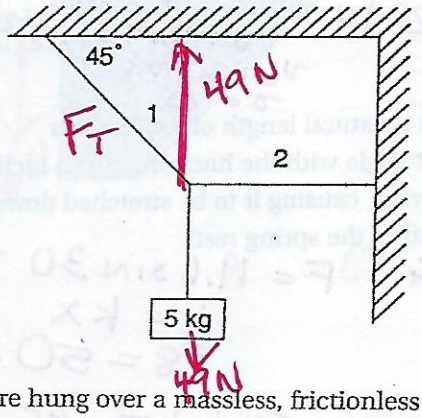


$v = \frac{5000\,m}{900\,sec} = 5.6\,m/s$

Multiple-Choice FORCES AND NEWTON'S LAWS OF MOTION

1. In the situation shown below, what is the tension in string 1?

(A) 69.3 N
(B) 98 N
(C) 138.6 N
(D) 147.6 N

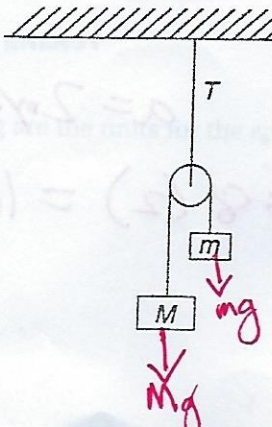


$\sin 45 = \frac{49}{F_T}$

$F_T = \frac{49}{\sin 45} = 69.3\,N$

2. Two masses, M and m, are hung over a massless, frictionless pulley as shown below. If $M > m$, what is the downward acceleration of mass M?

(A) g
(B) $\frac{(M-m)g}{M+m}$
(C) $\left(\frac{M}{m}\right)g$
(D) $\frac{Mmg}{M+m}$



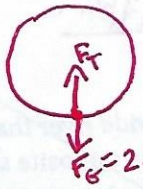
$\Sigma F = Mg - mg$

$(M+m)a = Mg - mg$

$a = \frac{Mg - mg}{M+m}$

3. A 0.25-kg mass is attached to a string and swung in a vertical circle whose radius is 0.75 m. At the bottom of the circle, the mass is observed to have a speed of 10 m/s. What is the magnitude of the tension in the string at that point?

(A) 2.45 N
(B) 5.78 N
(C) 22.6 N
(D) 35.7 N



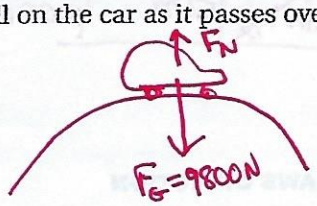
$F_r = F_T - F_G$

$\frac{mv^2}{r} = F_T - 2.45$

$\frac{(.25)(10^2)}{.75} = F_T - 2.45$

4. A car and driver have a combined mass of 1,000 kg. The car passes over the top of a hill that has a radius of curvature equal to 10 m. The speed of the car at that instant is 5 m/s. What is the force of the hill on the car as it passes over the top?

(A) 7,300 N up
(B) 7,300 N down
(C) 12,300 N up
(D) 12,300 N down



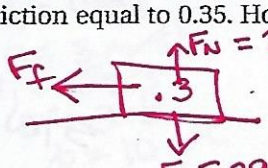
wants you to find F_N

$\frac{mv^2}{r} = F_G - F_N$

$\frac{(1000)(5)^2}{10} = 9800 - F_N$

5. A hockey puck with a mass of 0.3 kg is sliding along ice that can be considered frictionless. The puck's velocity is 20 m/s. The puck now crosses over onto a floor that has a coefficient of kinetic friction equal to 0.35. How far will the puck travel across the floor before it stops?

(A) 3 m
(B) 87 m
(C) 48 m
(D) 58 m



$\Sigma F = F_f = \mu F_N$

$\Sigma F = .35(2.94) = 1.03N$

$F = ma$ $\quad 1.03 = (.3)a$

$a = -3.43 m/s^2$

$v_0 = 20 m/s$

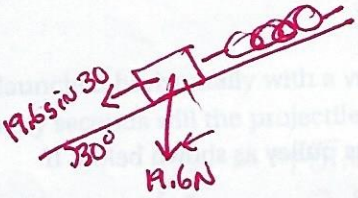
$v = 0$

$0^2 = 20^2 + 2(3.43)x$

$x = 58m$

6. A spring with a stiffness constant $k = 50$ N/m has a natural length of 0.45 m. It is attached to the top of an incline that makes a 30° angle with the horizontal. The incline is 2.4 m long. A mass of 2 kg is attached to the spring, causing it to be stretched down the incline. How far down the incline does the end of the spring rest?

(A) 0.196 m
(B) 0.45 m
(C) 0.646 m
(D) 0.835 m



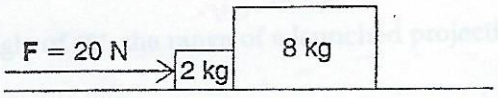
$F = 19.6 \sin 30 = 9.8N$

$F = kx$

$9.8 = 50x \quad x = .20m$

Total $= .45 + .20 = .65m$

7. A 20-N force is pushing two blocks horizontally along a frictionless floor as shown below.



What is the force that the 8-kg mass exerts on the 2-kg mass?

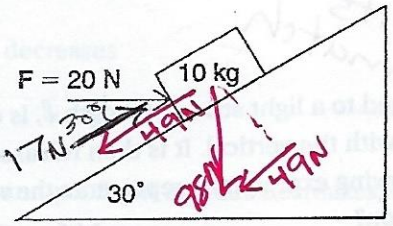
(A) 4 N
(B) 8 N
(C) 16 N
(D) 20 N

$F = ma$

$20 = 10a \quad a = 2 m/s^2$

$F = ma = 8(2) = 16N$

8. A force of 20 N acts horizontally on a mass of 10 kg being pushed up a frictionless incline that makes a 30° angle with the horizontal, as shown below.



$20 \cos 30 = 17N$

$49 - 17 = 32N$

$F = ma$

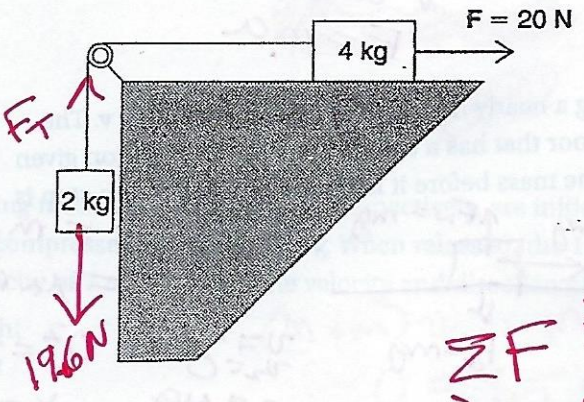
$32 = 10a$

$a = 3.2 m/s^2$

The magnitude of the acceleration of the mass up the incline is equal to

(A) 1.9 m/s²
(B) 2.2 m/s²
(C) 3.17 m/s²
(D) 3.87 m/s²

9. According to the diagram below, what is the tension in the connecting string if the table is frictionless?



$20 - 19.6N = .40N$

$\Sigma F = ma$

$.40 = 6a$

$a = .067 m/s^2$

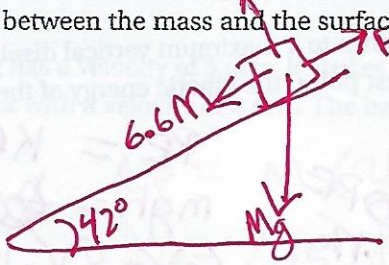
$\Sigma F = F_T - 19.6$

$(2)(.067) = F_T - 19.6$

$F_T = 19.7N$

(A) 6.4 N
(B) 13 N
(C) 19.7 N
(D) 25 N

10. A mass, M, is released from rest on an incline that makes a 42° angle with the horizontal. In 3 s, the mass is observed to have gone a distance of 3 m. What is the coefficient of kinetic friction between the mass and the surface of the incline?



$\Sigma F = Ma$

$.67M = 6.6M - F_f$

$F_f = 5.9M$

$\mu = \frac{F_f}{F_N} = \frac{5.9M}{7.3M} = .81$

$v_0 = 0$

$x = 3m$

$t = 3s$

$x = v_0 t + \frac{1}{2} a t^2$

$3 = \frac{1}{2} a (3)^2$

$a = .67 m/s^2$

(A) 0.8
(B) 0.7
(C) 0.6
(D) 0.5

Multiple-Choice ENERGY

1. Which of the following are the units for the spring constant, k?

(A) kg · m²/s²
(B) kg · s²
(C) kg · m/s
(D) kg/s²

$k = \frac{F}{X} = \frac{kg \cdot m/s^2}{m} = \frac{kg}{s^2}$

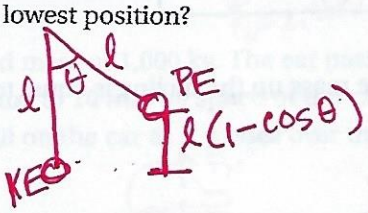
2. Which of the following is an expression for mechanical power?

(A) Ft/m
(B) F^2m/a
(C) Fm^2/t
(D) F^2t/m

check to see if units match

3. A pendulum consisting of a mass m attached to a light string of length ℓ, is displaced from its rest position, making an angle θ with the vertical. It is then released and allowed to swing freely. Which of the following expressions represents the velocity of the mass when it reaches its lowest position?

(A) $\sqrt{2g\ell(1-\cos\theta)}$
(B) $\sqrt{2g\ell(\tan\theta)}$
(C) $\sqrt{2g\ell(\cos\theta)}$
(D) $\sqrt{2g\ell(1-\sin\theta)}$



$KE = PE$
$\frac{1}{2}mv^2 = mgh$
$v^2 = 2gh$
$v = \sqrt{2g\ell(1-\cos\theta)}$

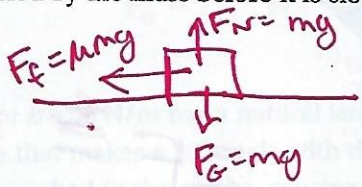
4. An engine maintains constant power on a conveyor belt machine. If the belt's velocity is doubled, the magnitude of its average acceleration

(A) is doubled
(B) is quartered
(C) is halved
(D) is quadrupled

$P = Fv$
v double $\rightarrow$ F $\frac{1}{2}$ as much
$F = ma$

5. A mass m is moving horizontally along a nearly frictionless floor with velocity **v**. The mass now encounters a part of the floor that has a coefficient of kinetic friction given by μ. The total distance traveled by the mass before it is slowed by friction to a stop is given by

(A) $2v^2/\mu g$
(B) $v^2/2\mu g$
(C) $2\mu g v^2$
(D) $\mu v^2/2g$



$\Sigma F = ma = F_f$
$ma = \mu mg$ $\quad a = \mu g$
$v = v$
$v_2 = 0$
$a = \mu g$
$x = ?$
$0^2 = v^2 + 2(\mu g)x$
$x = \frac{v^2}{2\mu g}$

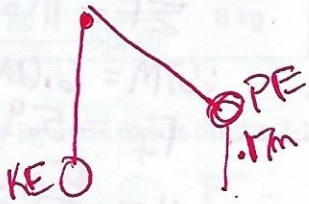
6. Two unequal masses are dropped simultaneously from the same height. The two masses will experience the same change in

(A) acceleration
(B) kinetic energy
(C) potential energy
(D) velocity

acceleration won't change

7. A pendulum that consists of a 2-kg mass swings to a maximum vertical displacement of 17 cm above its rest position. At its lowest point, the kinetic energy of the mass is equal to

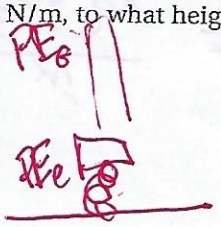
(A) 0.33 J
(B) 3.33 J
(C) 33.3 J
(D) 333 J



$PE = KE$
$mgh = KE$
$(2)(9.8)(.17) = KE = 3.33\,J$

8. A 0.3-kg mass rests on top of a spring that has been compressed by 0.04 m. Neglect any frictional effects, and consider the spring to be massless. Then, if the spring has a constant k equal to 2000 N/m, to what height will the mass rise when the system is released?

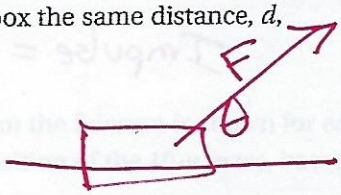
(A) 1.24 m
(B) 0.75 m
(C) 0.54 m



$\frac{1}{2}kx^2 = mgh$
$\frac{1}{2}(2000)(.04)^2 = (.3)(9.8)h$

9. A box is pulled along a smooth floor by a force F, making an angle θ with the horizontal. As θ increases, the amount of work done to pull the box the same distance, d,

(A) increases
(B) increases and then decreases
(C) remains the same
(D) decreases



as θ goes up less of the F is horizontal

10. As the time needed to run up a flight of stairs decreases, the amount of work done against gravity

(A) increases
(B) decreases
(C) remains the same
(D) increases and then decreases

Work doesn't have anything to do with time

Multiple-Choice IMPACTS AND LINEAR MOMENTUM

1. Which of the following expressions, where **p** represents the linear momentum of the particle, is equivalent to the kinetic energy of a moving particle?

(A) mp^2
(B) $m^2/2p$
(C) $2p/m$
(D) $p^2/2m$

Check to make sure units match

2. Two carts having masses 1.5 kg and 0.7 kg, respectively, are initially at rest and are held together by a compressed massless spring. When released, the 1.5-kg cart moves to the left with a velocity of 7 m/s. What is the velocity and direction of the 0.7-kg cart?

(A) 15 m/s right
(B) 15 m/s left
(C) 7 m/s left
(D) 7 m/s right

$(m+m)v = m_1v_1 + m_2v_2'$
$0 = 1.5(-7) + (.7)v_2'$
$v_2' = 15\ m/s$

3. The product of an object's instantaneous momentum and its acceleration is equal to its

(A) applied force
(B) kinetic energy
(C) power output
(D) net force

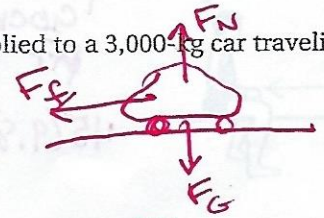
4. A ball with a mass of 0.15 kg has a velocity of 5 m/s. It strikes a wall perpendicularly and bounces off straight back with a velocity of 3 m/s. The ball underwent a change in momentum equal to

(A) 0.30 kg · m/s
(B) 1.20 kg · m/s
(C) 0.15 kg · m/s
(D) 5 kg · m/s

$\Delta p = m(v_2 - v_1)$
$\Delta p = (.15)(-3-5) =$

5. What braking force is supplied to a 3,000-kg car traveling with a velocity of 35 m/s that is stopped in 12 s?

(A) 29,400 N
(B) 3,000 N
(C) 8,750 N
(D) 105,000 N



$\Sigma F = F_f = ma = (3000)(-2.9$
$= -8750N$

$v_0 = 35$
$v_1 = 0$
$t = 12$

$v_1 = v_0 + at$
$0 = 35 + a(12)$
$a = -2.9\ m/s^2$

6. A 0.1-kg baseball is thrown with a velocity of 35 m/s. The batter hits it straight back with a velocity of 60 m/s. What is the magnitude of the average impulse exerted on the ball by the bat?

(A) 3.5 N · s
(B) 2.5 N · s
(C) 7.5 N · s
(D) 9.5 N · s

Impulse $= \Delta p = mv_2 - mv_1$
$(.1)(-60) - (.1)(35)$

7. A 1-kg object is moving with a velocity of 6 m/s to the right. It collides and sticks to a 2-kg object moving with a velocity of 3 m/s in the same direction. How much kinetic energy was lost in the collision?

(A) 1.5 J
(B) 2 J
(C) 2.5 J
(D) 3 J

$m_1v_1 + m_2v_2 = (m_1+m_2)v'$
$(1)6 + (2)(3) = (3)v'$ $\quad v' = 4$ m/s

KE Before	KE After
$\frac{1}{2}(1)(6)^2 + \frac{1}{2}(2)(3)^2 = 27$ J	$\frac{1}{2}(3)(4)^2 = 24$ J

8. A 2-kg mass moving with a velocity of 7 m/s collides elastically with a 4-kg mass moving in the opposite direction at 4 m/s. The 2-kg mass reverses direction after the collision and has a new velocity of 3 m/s. What is the new velocity of the 4-kg mass?

(A) −1 m/s
(B) 1 m/s
(C) 6 m/s
(D) 4 m/s

$m_1v_1 + m_2v_2 = m_1v_1' + m_2v_2'$
$(2)(7) + (4)(-4) = (2)(-3) + (4)v_2'$

9. A mass m is attached to a massless spring with a force constant k. The mass rests on a horizontal frictionless surface. The system is compressed a distance x from the spring's initial position and then released. The momentum of the mass when the spring passes its equilibrium position is given by

(A) $x\sqrt{mk}$
(B) $x\sqrt{k/m}$
(C) $x\sqrt{m/k}$
(D) $x\sqrt{k^2m}$

PE = KE
$\frac{1}{2}kx^2 = \frac{1}{2}mv^2$ $\quad v = \sqrt{\frac{kx^2}{m}}$

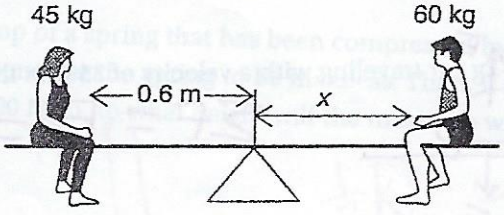
$p = mv = m\sqrt{\frac{kx^2}{m}} = x\sqrt{\frac{km^2}{m}}$

10. During an inelastic collision between two balls, which of the following statements is correct?

(A) Both momentum and kinetic energy are conserved.
(B) Momentum is conserved, but kinetic energy is not conserved.
(C) Momentum is not conserved, but kinetic energy is conserved.
(D) Neither momentum nor kinetic energy is conserved.

Multiple-Choice ROTATIONAL MOTION

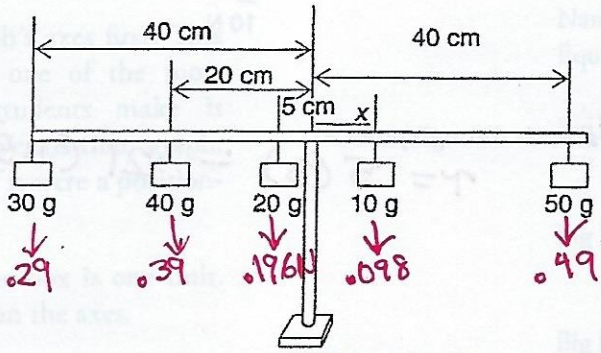
1. A 45-kg girl is sitting on a seesaw 0.6 m from the balance point, as shown below. How far, on the other side, should a 60-kg boy sit so that the seesaw will remain in balance?



(A) 0.30 m
(B) 0.35 m
(C) 0.40 m
(D) 0.45 m

$\tau_{CLOCK} = \tau_{COUNT}$
$Fr = Fr$
$45(9.8)(.6) = 60(9.8)x$
$x = .45$ m

2. A balanced stick is shown below. The distance from the fulcrum is shown for each mass except the 10-g mass. What is the approximate position of the 10-g mass, based on the diagram?



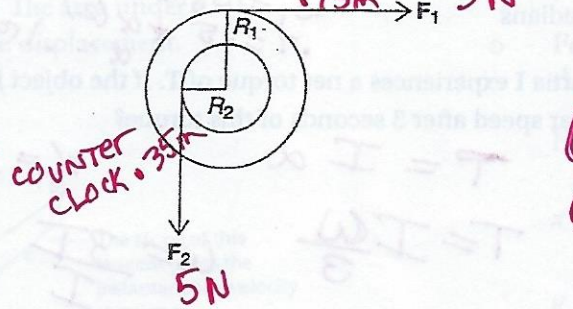
CLOCK = COUNTER

(.098)x + .49(.40) = (.196)(.05) + (.39)(.20) + (.29)(.40)

X = .0796 m

(A) 7 cm
(B) 9 cm
(C) 10 cm
(D) 15 cm

3. A solid cylinder consisting of an outer radius R_1 and an inner radius R_2 is pivoted on a frictionless axle as shown below. A string is wound around the outer radius and is pulled to the right with a force $F_1 = 3$ N. A second string is wound around the inner radius and is pulled down with a force $F_2 = 5$ N. If $R_1 = 0.75$ m and $R_2 = 0.35$ m, what is the net torque acting on the cylinder?

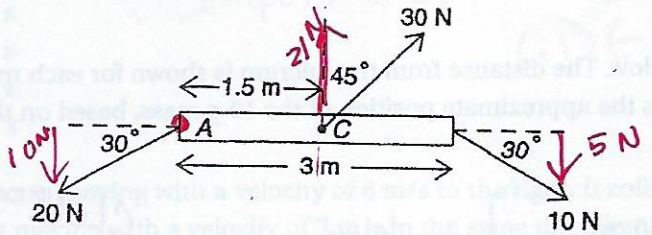


CLOCKWISE
.75m
3N
COUNTER CLOCK .35m
5N

(A) 2.25 N · m
(B) −2.25 N · m
(C) 0.5 N · m
(D) −0.5 N · m

$\tau = 3(.75) + -5(.35) = .5$ N·m

Answer questions 4 and 5 based on the following diagram. The rod is considered massless.



4. What is the net torque about an axis through point *A*?

$\tau = 5(3) - 21(1.5) =$

(A) 16.8 N · m
(B) 15.2 N · m
(C) –5.5 N · m
(D) –7.8 N · m

5. What is the net torque about an axis through point *C*?

$10(1.5) - (5)(1.5)$

(A) 3.5 N · m
(B) 7.5 N · m
(C) –15.2 N · m
(D) 5.9 N · m

6. Compute the average angular acceleration and the angular displacement during the 2 seconds a rotating object speeds up from 0.5 rad/s to 0.7 rad/s.

(A) $\alpha = 0.1$ rad/s^2 $\Delta\theta = 0.3$ radians
(B) $\alpha = 0.2$ rad/s^2 $\Delta\theta = 0.5$ radians
(C) $\alpha = 0.1$ rad/s^2 $\Delta\theta = 1.2$ radians
(D) $\alpha = 0.2$ rad/s^2 $\Delta\theta = 1.2$ radians

$\omega_0 = .5$ rad/s
$\omega_1 = .7$ rad/s
$t = 2$ sec
$\omega_1 = \omega_0 + \alpha t$
$.7 = .5 + \alpha(2)$
$\alpha = .1$ rad/s^2

7. An object with a moment of inertia **I** experiences a net torque of **T**. If the object is initially at rest, what is its angular speed after 3 seconds of this torque?

$\tau = I\alpha$ $\alpha = \frac{\omega}{t} = \frac{\omega}{3}$

$T = I\frac{\omega}{3}$ $\omega = \frac{3T}{I}$

(A) 3IT
(B) 9IT
(C) 3I/T
(D) 3T/I

8. If a spinning ball of clay on top of a freely turning frictionless tabletop increases its rotational inertia by 50 percent by bulging outward, what will happen to the rotational speed of the clay and tabletop?

$I_0\omega_0 = I_1\omega_1$

(A) It will be half as fast.
(B) It will be 1.5 times faster.
(C) It will be 4 times slower.
(D) It will be slower by a factor of 2/3.