Exam 1 Practice

Due: 11:00am on Wednesday, September 12, 2012

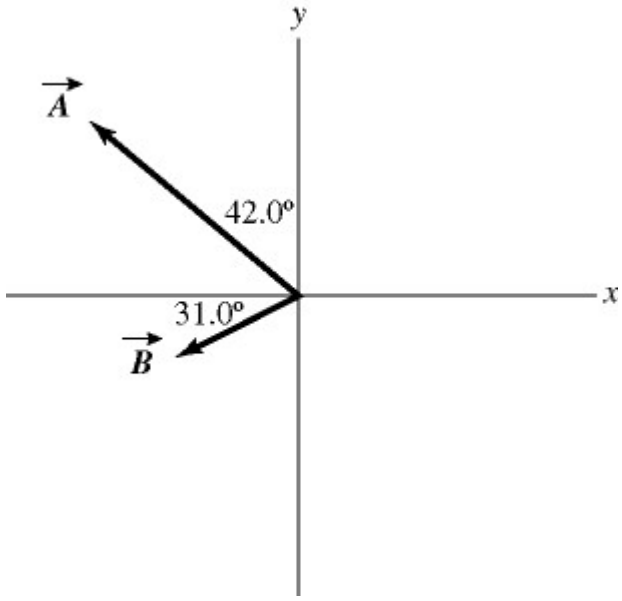
Note: You will receive no credit for late submissions. To learn more, read your instructor's Grading Policy

Multiple Choice Question - 1.12

Part A

Figure 1.1

Vectors $\vec{A}$ and $\vec{B}$ are shown. Vector $\vec{C}$ is given by $\vec{C} = \vec{B} - \vec{A}$. The magnitude of vector $\vec{A}$ is 16.0 units, and the magnitude of vector $\vec{B}$ is 7.00 units.



In Fig. 1.1, the angle to vector $\vec{C}$, measured counterclockwise from the *x*-axis, is closest to:

ANSWER:

- 22.4°
- 73.1°
- 16.9°
- 292°
- 287°

Correct

Multiple Choice Question - 1.16

Part A

Two vectors are given as follows:

$\vec{A} = +4\vec{i} - 2\vec{j} - 2\vec{k}$

$\vec{C} = -2\vec{i} - 2\vec{j} - 3\vec{k}$

The magnitude of $|\vec{A} - \vec{C}|$ is closest to:

ANSWER:

- 7
- 5
- 9
- 6
- 8

Correct

Short Answer Question - 1.4

Part A

Find the angle, in degrees, between the vectors $\vec{A}$ = 3$\vec{i}$ + 5$\vec{j}$ - 2$\vec{k}$ and $\vec{B}$ = -7$\vec{i}$ + 5$\vec{j}$ + 6$\vec{k}$.

ANSWER:

97.1

Correct

Short Answer Question - 1.3

Part A

Find the vector product $\vec{A} \times \vec{B}$ of the two vectors $\vec{A}$ and $\vec{B}$, where $\vec{A}$ = **7** $\vec{i}$ + 8 $\vec{j}$ and $\vec{B}$ = -6 $\vec{j}$ - 3 $\vec{k}$. Express your result in terms of the $\vec{i}$, $\vec{j}$, and $\vec{k}$ unit vectors.

ANSWER:

$-24\vec{i} + 21\vec{j} - 42\vec{k}$

Correct

Multiple Choice Question - 2.4

Part A

A car moving at a velocity of 20 m/s is behind a truck moving at a constant velocity of 18 m/s. When the car is 50 m behind the front of the truck, the car accelerates uniformly at 1.8 m/s^2. The car continues at the same acceleration until it reaches a velocity of 25 m/s, which is the legal speed limit. The car then continues at a constant velocity of 25 m/s until it passes the front of the truck. The distance the car travels while accelerating, in meters, is closest to:

ANSWER:

- 66
- 62
- 54
- 58
- 50

Correct

Multiple Choice Question - 2.10

Part A

A ball is projected upward at time t = 0.0 s, from a point on a roof 80 m above the ground. The ball rises, then falls and strikes the ground. The initial velocity of the ball is 56.7 m/s. Consider all quantities as positive in the upward direction. At time t = 2.9 s, the acceleration of the ball is closest to:

ANSWER:

- zero
- -5 m/s^2
- +10 m/s^2
- +5 m/s^2
- -10 m/s^2

Correct

Multiple Choice Question - 2.11

Part A

A ball is projected upward at time t = 0.0 s, from a point on a roof 20 m above the ground. The ball rises, then falls and strikes the ground. The initial velocity of the ball is 61.8m/s. Consider all quantities as positive in the upward direction. At time $t = 6.31\text{s}$, the velocity of the ball is closest to:

ANSWER:

- (•) zero
- ( ) -195 m/s
- ( ) -12 m/s
- ( ) +195 m/s
- ( ) +12 m/s

Correct

Multiple Choice Question - 2.14

Part A

A ball is projected upward at time *t* = 0.0 s, from a point on a roof 70 m above the ground. The ball rises, then falls and strikes the ground. The initial velocity of the ball is 67.6m/s. Consider all quantities as positive in the upward direction. The time when the ball strikes the ground is closest to:

ANSWER:

- 16.7 s
- 12.8 s
- 16.0 s
- 14.8 s
- 13.5 s

Correct

Multiple Choice Question - 2.15

Part A

A motorist traveling at a constant speed of 90 km/h in a 50-km/h speed zone passes a parked police car. Three seconds after the car passes, the police car starts off in pursuit. The policeman accelerates at 2 $\mathrm{m/s^2}$ up to a speed of 40 m/s, and then continues at this speed until he overtakes the speeding motorist. How long from the time he started does it take the police car to overtake the motorist? The motorist continues at a constant speed during this process.

ANSWER:

- 65 s
- 20 s
- 32 s
- 33 s
- 23 s

Answer Requested

Multiple Choice Question - 2.16

Part A

Figure 2.2

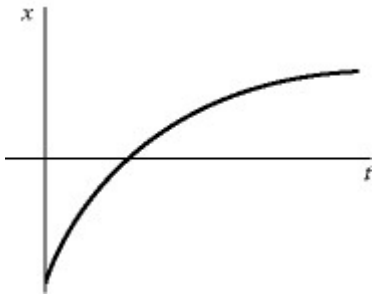
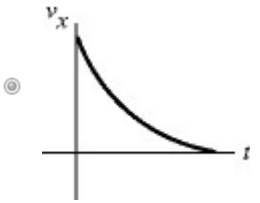
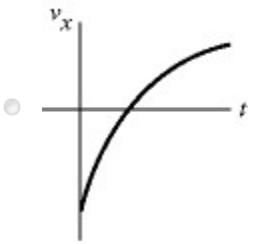


Figure 2.2 shows the graph of the position *x* as a function of time for an object moving in the straight line (the *x*-axis). Which of the following graphs

best describes the *x*-component of the velocity as a function of time for this object?

ANSWER:


v_x
t


v_x
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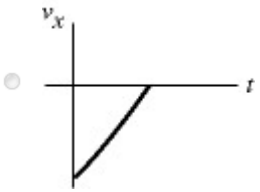
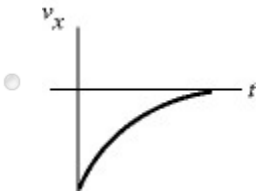
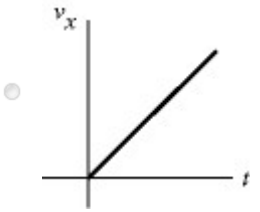

v_x
t


v_x
t


v_x
t

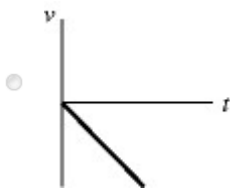
Answer Requested

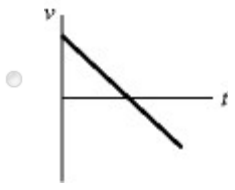
Multiple Choice Question - 2.18

Part A

A child standing on a bridge throws a rock straight down. The rock leaves the child's hand at t = 0. Which of the graphs shown here best represents the velocity of the stone as a function of time?

ANSWER:


v
t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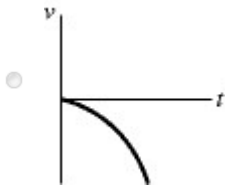
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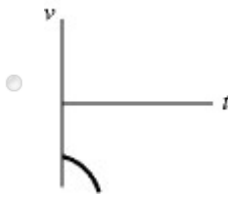
v
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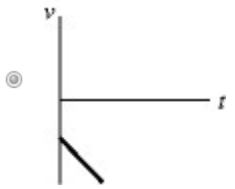

v
t

Answer Requested

Multiple Choice Question - 2.19

Part A

Two identical balls are thrown vertically with the same initial speed from the roof of a building and feel no air resistance. Ball A is thrown straight up and ball B is thrown straight down. Which of the following statements about these balls are correct? (There may be more than one correct answer.)

ANSWER:

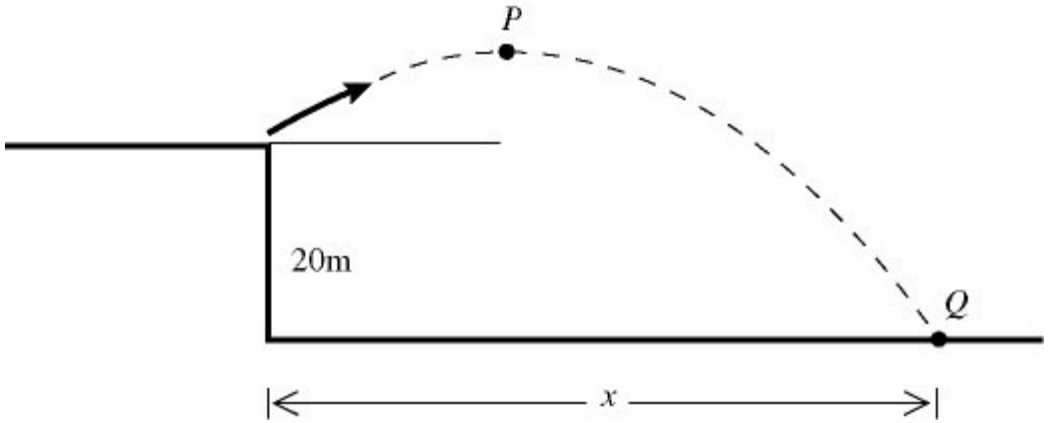
- Between the instant at which each ball is thrown and the instant at which it hits the ground, both balls have the same average velocity.
- Ball B has a greater velocity just before it hits the ground than ball A.
- Between the instant at which each ball is thrown and the instant at which it hits the ground, both balls experience the same displacement.
- Between the instant at which each ball is thrown and the instant at which it hits the ground, both balls have the same average speed.
- Both balls have the same velocity just before they hit the ground.

Answer Requested

Multiple Choice Question - 3.9

Part A

Figure 3.2



A projectile is fired from the origin (at y = 0 m) as shown in the figure. The initial velocity components are v_{0x} = 110 m/s and v_{0y} = 62 m/s. The projectile reaches maximum height at point P, then it falls and strikes the ground at point Q. In Fig. 3.2, the x-component of the velocity of the shell at point P is closest to:

ANSWER:

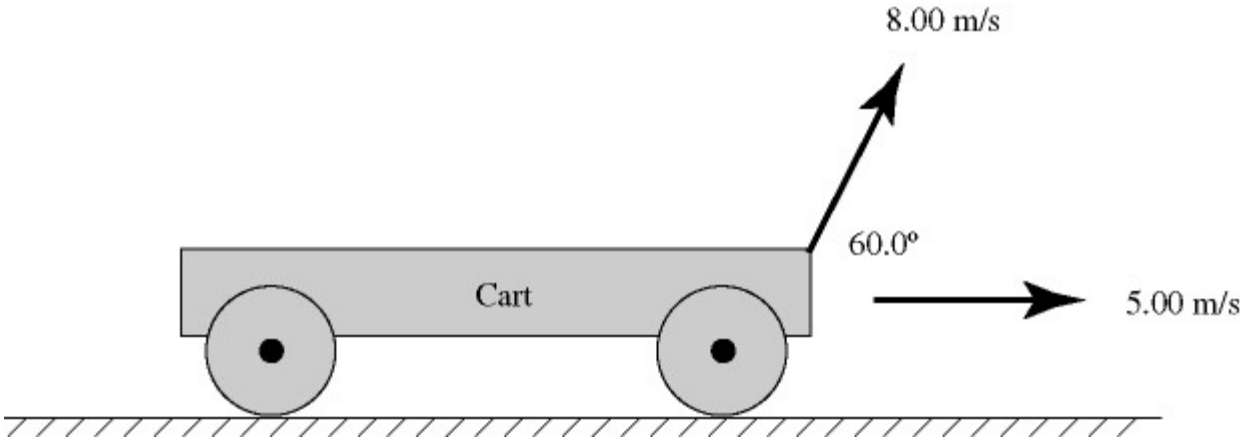
- zero
- 110 m/s
- 28 m/s
- 83 m/s
- 55 m/s

Answer Requested

Multiple Choice Question - 3.12

Part A

Figure 3.3



A cart is moving with a constant horizontal velocity of 5.00 m/s. A small pebble is launched from the front of the cart with a velocity of 8.00 m/s at 60.0° above the horizontal as measured relative to the cart (see Fig. 3.3). Just as the pebble returns to the level from which it was launched, its distance from the front of the cart is closest to:

ANSWER:

- 9.19 m
- 11.3 m
- 5.66 m
- 4.60 m
- 2.83 m

Answer Requested

Multiple Choice Question - 3.19

Part A

A satellite orbits the earth a distance of 1.50×10^7 m above the planet's surface and takes 4.89 hours for each revolution about the earth. The earth's radius is 6.38×10^6. The acceleration of this satellite is closest to:

ANSWER:

- $1.91\ m/s^2$
- $0.0690\ m/s^2$
- $9.80\ m/s^2$
- $0.813\ m/s^2$
- $2.72\ m/s^2$

Answer Requested

Multiple Choice Question - 3.25

Part A

Two particles, A and B, are in uniform circular motion about a common center with the same radial acceleration. Particle A moves in a circle of 8.9 m radius with a periods of 4.3 s. Particle B moves with a speed of 2.9 m/s. The period of the motion of particle B is closest to:

ANSWER:

- 1.0 s
- 1.1 s
- 0.96 s
- 0.90 s
- 0.84 s

Answer Requested

Score Summary:

Your score on this assignment is 0%.
You received 0 out of a possible total of 0 points.