The components of vector $\vec{A}$ are A_x = + 3.90 and A_y = -4.00. What is the angle measured counterclockwise from the +x-axis to vector $\vec{A}$?

- 134°
- 314°

Vector $\vec{A}$ = 1.00 $\hat{i}$ - 2.00 $\hat{j}$ and vector $\vec{B}$ = 3.00 $\hat{i}$ + 4.00 $\hat{j}$. What are the magnitude and direction of vector $\vec{C} = \vec{A} + \vec{B}$?

- 7.21 in a direction 56.3° counterclockwise from the positive x axis
- 6.00 in a direction 63.4° counterclockwise from the positive x axis
- 7.21 in a direction 33.7° counterclockwise from the positive x axis
- 4.47 in a direction 6.34° counterclockwise from the positive x axis
- 4.47 in a direction 26.6° counterclockwise from the positive x axis

The position x, in meters, of an object is given by the equation $x = A t^2 + B t$, where t represents time in seconds. The SI units of A and B are:

- m/s, m/s^2
- m, m/s
- m/s^2, m/s

You walk 50 m to the north, then turn 60° to your right and walk another 45 m. How far are you from where you originally started?

- 93 m
- 78 m
- 82 m
- 89 m

A vector **A** has a magnitude of 7 units and is in the direction of positive x-axis, a vector **B** has a magnitude of 4 units and making an angle of 30° with the positive x-axis. The magnitude of **A** cross **B** is:

▶ View Available Hint(s)

- 14 units

If $\vec{C} = -4\,\hat{i} - 3\,\hat{j} - 2\,\hat{k}$, what is $\vec{C} \times \hat{j}$?

- $+3\,\hat{i} + 4\,\hat{k}$
- $+3\,\hat{i} + 2\,\hat{j} - 4\,\hat{k}$
- $-3\,\hat{i} + 4\,\hat{j}$
- $+2\,\hat{i} - 4\,\hat{k}$

If $\vec{A}$ = + 2 $\hat{i}$ - 2 $\hat{j}$ - 3 $\hat{k}$ and $\vec{C}$ = - 2 $\hat{i}$ -2 $\hat{j}$ - 3 $\hat{k}$, which of the following numbers is closest to the magnitude of $\vec{A}$ - $\vec{C}$?

- 6
- 4
- 2

A car is travelling with acceleration 20 km/min^2. Its acceleration in S.I. units is:

- $4.3\ m/s^2$
- $5.6\ m/s^2$

The SI units of the basic quantities (Length, Mass, Time) are:

- cm, g, s
- km, kg, s
- m, kg, s

If $\vec{B}$ = -2 $\hat{i}$ - 8 $\hat{j}$ + 2 $\hat{k}$ and $\vec{C}$ = - 3 $\hat{i}$ -2 $\hat{j}$ - 3 $\hat{k}$, which of the following numbers is closest to the magnitude of $\vec{C} \times \vec{B}$?

- 32
- 36

Which of the following quantities is not a vector quantity?

- Acceleration
- Velocity
- Mass

A cubic box with an edge of 3.5 cm has a volume of:

- $3.594\ 10^{-5}\ m^3$
- $6.892\ 10^{-5}\ m^3$
- $4.288\ 10^{-5}\ m^3$

Determine the angle between the directions of vector $\vec{A}$ = 5.00 $\hat{i}$ + 2.00 $\hat{j}$ and vector $\vec{B}$ = - 5.00 $\hat{i}$ + 3.00 $\hat{j}$.

- 127°
- 76.3°

A solid cube of mass m = 200 g and side length a = 10 cm. Its density in S.I. units is:

- 2×10^4 kg/m^3
- 200 kg/m^3

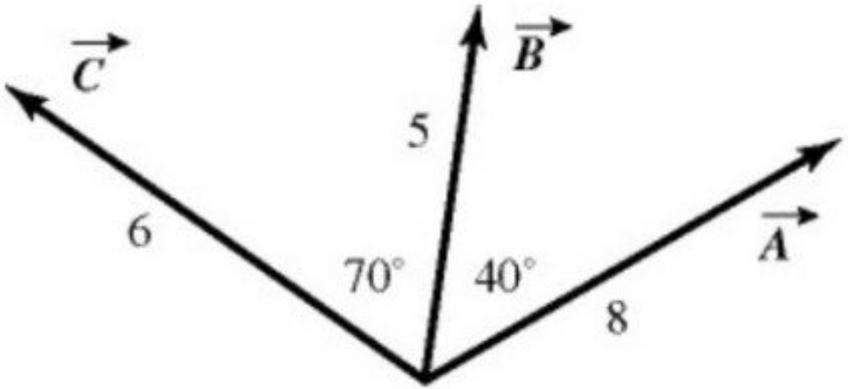
If two nonzero vectors point in the same direction, their dot product must be zero.

- ○ True
- ◉ False

If the dot product of two nonzero vectors is zero, then vectors must be:

- vectors point in opposite directions.
- vectors must be unit vectors.
- vectors point in the same direction
- vectors must be perpendicular to each other.

For the vectors shown in the figure, find the magnitude and direction of $\vec{B} \times \vec{A}$, assuming that the quantities shown are accurate to two significant figures.



- 31, directed into the plane
- 31, directed on the plane
- 26, directed into the plane

The components of vector A are given as $A_x = -3$ m and $A_y = 4$ m. Their magnitude is:

(A) 2.5 m (B) 5 m (C) 7.5 m (D) 10 m

- ○ 2.5 m
- ◉ 5 m

A package is dropped from a helicopter moving upward at 15 m/s. If it takes 21 s before the package strikes the ground, how high above the ground was the package when it was released if air resistance is negligible?

- 1080 m
- 1440 m
- 2160 m
- 1800 m

A boy shot a foot ball vertically up with an initial speed v_0. When the ball was 2 m above the ground, the speed was 0.4 of the initial speed. The initial speed is:

- 8.41m/s
- 6.83m/s

Two identical stones are dropped from rest and feel no air resistance as they fall. Stone A is dropped from height h, and stone B is dropped from height 2 h. If stone A takes time t to reach the ground, stone B will take time

- $4t$.
- $t/2$.
- $t/\sqrt{2}$.
- $2t$.
- $t\sqrt{2}$.

The velocity of an object as a function of time is given by $v(t) = 2.00\ \text{m/s} + (3.00\ \text{m/s}^2)\,t - (1.0\ \text{m/s}^3)\,t^2$. Determine the instantaneous acceleration of the object at time $t = 4.00$ s.

- $-5.00\ \text{m/s}^2$

A particle moves in the positive x-direction with increasing speed. Its velocity and acceleration are such that:

- Velocity is positive and acceleration is negative
- Velocity is negative and acceleration is positive
- Velocity is positive and acceleration is zero
- Velocity and acceleration are both positive

A ball is dropped vertically downwards from a height h. If the ball reaches a height of 30 m above the ground in 2 s, the height h is:

- 39.6 m
- 49.6 m

A car accelerates from 8 m/s to 28.0 m/s} at a rate of 3.00 m/s^2. How far does the car travel while accelerating?

- 204 m
- 120 m

A dragster starts from rest and travels 1/4 mi in 6.30 s with constant acceleration. What is its velocity when it crosses the finish line?

- 143 mi/h
- 343 mi/h
- 286 mi/h

A ball is thrown vertically upward at a speed of 13.72 m/s. It will reach its maximum height in:

- 1.80 s
- 1.40 s

The position of an object is given by $x = at^3 - bt^2 + ct$,where $a = 4.1$ m/s^3, $b = 2.2$ m/s^2, $c = 1.7$ m/s, and x and t are in SI units. What is the instantaneous acceleration of the object when $t = 3.8$ s?

- 71.3 m/s^2
- 89.1 m/s^2

A car moves along the x-axis with constant speed, the acceleration of the car is:

- Increasing
- Decreasing
- Zero
- $9.8 m/s^2$

The following are equations of the velocity v(t) of a particle. In which situation the acceleration is constant?

- $v(t)= 2t^2 - 3$
- $v(t)= 10 - 5t^2$
- $v(t)= 7t - 2$

The position of an object as a function of time is given by $x = bt^2 - ct$, where $b = 2.0$ m/s^2 and $c = 6.7$ m/s, and x and t are in SI units. What is the instantaneous velocity of the object when $t = 3.3$?

- 5.2 m/s
- 6.5 m/s

A particle starts motion at 10 m/s. If it moves 30 m in 5 s, its final velocity is:

- 20 m/s
- 2 m/s
- 5 m/s
- 10 m/s

A ball is thrown directly upward and experiences no air resistance. Which one of the following statements about its motion is correct?

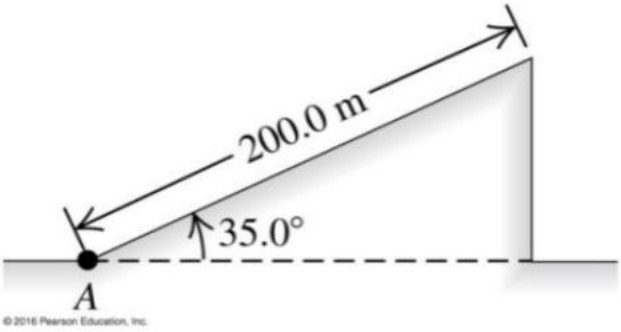
- The acceleration of the ball is upward while it is traveling up and downward while it is traveling down.
- The acceleration is downward during the entire time the ball is in the air.
- The acceleration of the ball is downward while it is traveling up and downward while it is traveling down but is zero at the highest point when the ball stops.
- The acceleration of the ball is downward while it is traveling up and upward while it is traveling down.

A particle moves with initial velocity 3m/s and acceleration of 2 m/s^2, the distance it traveled in 5 s is:

- 28 m
- 18 m
- 54 m
- 40 m

A car rounds a 10 m radius curve at 5 m/s. The magnitude of its acceleration is:

- $3.6\ m/s^2$
- $4.9\ m/s^2$
- $1.6\ m/s^2$
- $2.5\ m/s^2$



A test rocket starting from rest at point A is launched by accelerating it along a 200 m incline at 2 m/s^2. The incline rises at 35° above the horizontal, and at the instant the rocket leaves it, the engines turn off. Find the maximum height above the ground that the rocket reaches.

- 121 m
- 135 m
- 142 m
- 128 m

A projectile is launched to achieve a maximum range of 125 m, the speed of the projectile must be:

- ○ 28 m/s
- ○ 42 m/s
- ◉ 35 m/s
- ○ 49 m/s

An object has a position given by $\vec{r} = [2.0\ \mathrm{m} + (1.00\ \mathrm{m/s})t]\ i + [3.0\ \mathrm{m} - (2.00\ \mathrm{m/s^2})t^2]\ j$, where quantities are in SI units. What is the speed of the object at time t = 2.00 s?

- 4.84 m/s
- 11.3 m/s
- 8.06 m/s

A boy throws a rock with an initial velocity of 4.14 m/s at 30.0° above the horizontal. If air resistance is negligible, how long does it take for the rock to reach the maximum height of its trajectory?

- 0.169 s
- 0.253 s
- 0.211 s
- 0.295 s

Object A has a position as a function of time given by $\vec{r}_{\mathrm{A}}(t) = (3.00\ \mathrm{m/s})t\ \hat{i} + (1.00\ \mathrm{m/s^2})t^2\ \hat{j}$. Object B has a position as a function of time given by $\vec{r}_{\mathrm{B}}(t) = (4.00\ \mathrm{m/s})t\ \hat{i} + (-1.00\ \mathrm{m/s^2})t^2\ \hat{j}$. All quantities are SI units. What is the distance between object A and object B at time t = 4.00 s?

- 45.1 m
- 25.8 m
- 19.3 m
- 38.7 m
- 32.2 m

A car moves at constant speed in a horizontal circle of radius 5 m, making a complete circle in 4.0 s. The car acceleration is:

- 12.3 m/s^2
- 14.8m/s^2
- 27.1m/s^2
- 22.2 m/s^2

A car starts a trip from Dammam 480 km straight road to Riyadh for 4.0 hours. Immediately the car turned around and return to Dammam in 4.0 hours.Find the average speed for the whole trip.

- 106.66 km/h
- 96 km/h
- 120 km/h
- 80 km/h

A stone is thrown horizontally from the top of a tall building. It follows a path that is:

- Two straight lines
- A straight line
- Circular
- Parabolic

An object has a position given by $\vec{r} = [2.0\ \mathrm{m} + (4.00\ \mathrm{m/s})t]\ \hat{i} + [3.0\mathrm{m} - (3.00\ \mathrm{m/s^2})t^2]\ \hat{j}$, where all quantities are in SI units. What is the magnitude of the acceleration of the object at time t = 2.00 s?

- 7.20 m/s^2
- 3.00 m/s^2
- 6.00 m/s^2
- 4.80 m/s^2
- 0.00 m/s^2

A ball is thrown at a 60.0° angle above the horizontal across level ground. It is thrown from a height of 2.00 m above the ground with a speed of 23.3 m/s and experiences no appreciable air resistance. The time the ball remains in the air before striking the ground is closest to

- 5.05 s.
- 4.21 s.
- 3.37 s.
- 5.89 s.
- 2.53 s.

A truck is traveling with a constant speed of 12 m/s. When the truck follows a curve in the road, its centripetal acceleration is 9.0 m/s^2. The radius of the curve is:

- 18 m
- 24 m
- 16 m
- 36 m

A player throws a ball at an angle θ to the horizontal with velocity 9 m/s. The maximum horizontal range that the ball can reach is:

- 10.20 m
- 3.67m
- 6.53 m
- 8.26 m

The velocity and acceleration of a body in uniform circular motion are:

- (●) perpendicular
- ( ) differed by 135
- ( ) differed by 45
- ( ) parallel

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