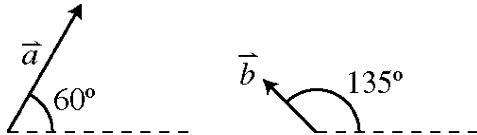


Vector Test Review

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Use a metric ruler and a protractor to find $2\vec{a} - 2\vec{b}$. Then find the magnitude and amplitude of the resultant.



- | | |
|---|---|
| <p>a. 6 cm, 36°</p> <p>b. 8 cm, 41°</p> | <p>c. 9 cm, 38°</p> <p>d. 4 cm, 31°</p> |
|---|---|
- _____ 2. Identify the ordered pair that represents the vector from $A(-8, -1)$ to $B(-5, 3)$ and the magnitude of \overrightarrow{AB} .
- | | |
|---|---|
| <p>a. $\langle 3, 4 \rangle, \sqrt{25} \approx 5$</p> <p>b. $\langle 4, 9 \rangle, \sqrt{32} \approx 7$</p> | <p>c. $\langle 4, 3 \rangle, \sqrt{27} \approx 6$</p> <p>d. $\langle 3, 5 \rangle, \sqrt{21} \approx 3$</p> |
|---|---|
- _____ 3. Given vectors $\vec{u} = -5\vec{i} + 9\vec{j}$ and $\vec{v} = 4\vec{i} + 9\vec{j}$, find $2\vec{u} - 10\vec{v}$ in terms of unit vectors \vec{i} and \vec{j} .
- | | |
|---|---|
| <p>a. $-71\vec{i} - 51\vec{j}$</p> <p>b. $-50\vec{i} - 72\vec{j}$</p> | <p>c. $-77\vec{i} - 51\vec{j}$</p> <p>d. $-47\vec{i} - 51\vec{j}$</p> |
|---|---|
- _____ 4. Forces of 18 pounds and 20 pounds act on an object at an angle of 120° . Find the magnitude of the resultant force.
- | | |
|---|---|
| <p>a. 32.9 pounds</p> <p>b. 19.1 pounds</p> | <p>c. 36.7 pounds</p> <p>d. 10.0 pounds</p> |
|---|---|
- _____ 5. Without the wind, a plane would fly due east at a rate of 150 mph. The wind is blowing southeast at a rate of 50 mph. The wind is blowing at a 45° angle from due east. What is the actual speed of the plane with the wind?
- | | |
|---|---|
| <p>a. 188.7 mph</p> <p>b. 158.1 mph</p> | <p>c. 150.0 mph</p> <p>d. 120.0 mph</p> |
|---|---|

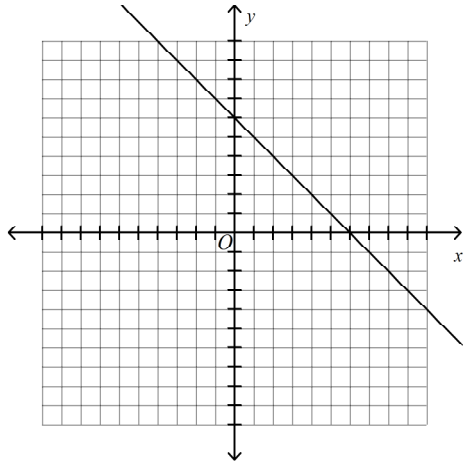
- _____ 6. The resultant of two forces acting on a body has a magnitude of 80 pounds. The angles between the resultant and the forces are 20° and 52° . Find the magnitude of the larger force.
- | | |
|----------------|-----------------|
| a. 34.7 pounds | c. 66.3 pounds |
| b. 28.8 pounds | d. 184.3 pounds |
- _____ 7. The resultant of two forces acting on a body has a magnitude of 60 pounds. The angle between the 28-pound force and the resultant is 50° . Find the magnitude of the other force.
- | | |
|----------------|----------------|
| a. 66.3 pounds | c. 80.9 pounds |
| b. 47.2 pounds | d. 59.3 pounds |
- _____ 8. Without the wind, a plane would fly due east at a rate of 150 mph. The wind is blowing southeast at a rate of 50 mph. The wind is blowing at a 45° angle from due east. How far off of the due east path does the wind blow the plane?
- | | |
|----------------|-----------------|
| a. 5.3° | c. 10.8° |
| b. 7.5° | d. 0.2° |
- _____ 9. Write a vector equation of the line that passes through $P(3, 3)$ and is parallel to $\vec{a} = \langle 9, -6 \rangle$.
- | | |
|---|---|
| a. $\langle x + 11, y + 10 \rangle = t \langle -6, 5 \rangle$ | c. $\langle x - 7, y - 11 \rangle = t \langle 5, 7 \rangle$ |
| b. $\langle x - 3, y - 3 \rangle = t \langle 9, -6 \rangle$ | d. $\langle x + 9, y + 5 \rangle = t \langle 7, -3 \rangle$ |
- _____ 10. Write an equation in slope-intercept form of the line with the given parametric equations.
- $x = 9t + 2$
 $y = 2t - 2$
- | | |
|---------------------------------------|--------------------------------------|
| a. $y = \frac{2}{9}x - \frac{22}{9}$ | c. $y = \frac{9}{2}x - \frac{9}{22}$ |
| b. $y = -\frac{22}{9}x + \frac{2}{9}$ | d. $y = \frac{2}{5}x + \frac{2}{3}$ |

11. Set up a table of values and then graph the line from its parametric form.

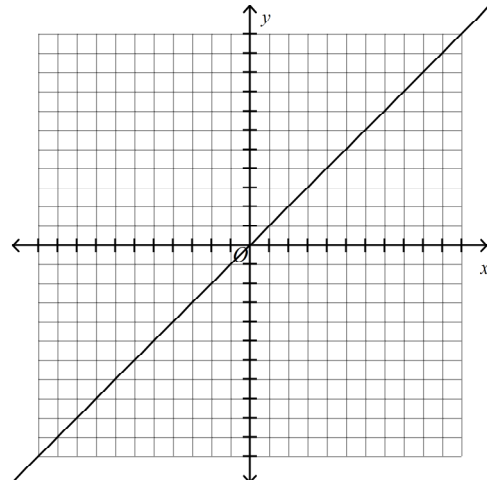
$$x = 3 + 7t$$

$$y = -3 + 7t$$

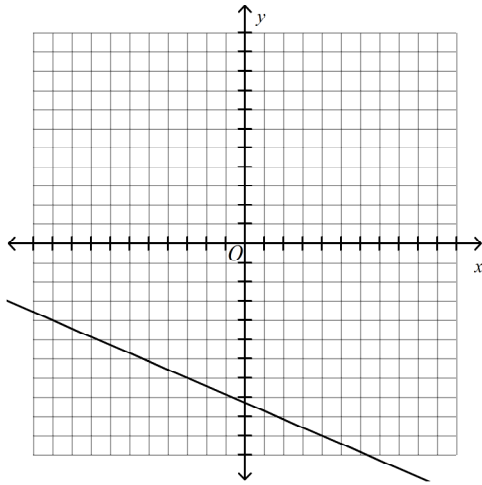
a.



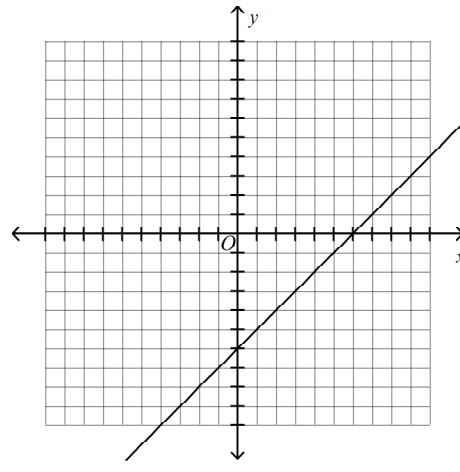
c.



b.



d.



12. A rock is tossed at an initial velocity of 60 m/s at an angle of 10° with the ground. Write parametric equations to represent the path of the rock.

a. $x = 60t \cos 10^\circ$
 $y = 60t \sin 10^\circ - 16t^2$

c. $x = 60t \cos 80^\circ$
 $y = 60t \sin 80^\circ - 16t^2$

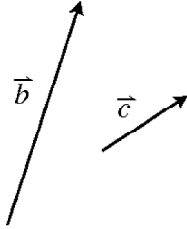
b. $x = 60t \cos 10^\circ$
 $y = 60t \sin 10^\circ - 4.9t^2$

d. $x = 10t \cos 10^\circ$
 $y = 10t \sin 10^\circ - 4.9t^2$

- _____ 13. A rock is tossed at an initial velocity of 60 m/s at an angle of 10° with the ground. After 0.9 second, how far has the rock traveled horizontally and vertically?
- a. 9.4 m horizontally and 40.2 m vertically
 - b. 53.2 m horizontally and 5.4 m vertically
 - c. 53.2 m horizontally and 3.6 m vertically
 - d. 8.9 m horizontally and 2.4 m vertically
- _____ 14. A toy rocket is launched at an initial velocity of 50 ft/s at an angle of 75° with the horizontal. How long will it take for the rocket to travel 20 feet horizontally?
- a. 0.4 second
 - b. 9.7 seconds
 - c. 2.6 seconds
 - d. 1.5 seconds
- _____ 15. A golf ball is hit with an initial velocity of 155 ft/s at an angle of 23° with the horizontal. After 1.4 seconds, how far has the golf ball traveled horizontally and vertically?
- a. 199.7 feet horizontally and 75.2 feet vertically
 - b. 60.6 feet horizontally and 168.4 feet vertically
 - c. 199.7 feet horizontally and 53.4 feet vertically
 - d. 60.6 feet horizontally and 174.4 feet vertically
- _____ 16. A discus is thrown from a height of 3 feet with an initial velocity of 55 ft/s at an angle of 44° with the horizontal. How long will it take for the discus to reach the ground?
- a. 2.5 seconds
 - b. 18.3 seconds
 - c. 0.8 second
 - d. 2.6 seconds
- _____ 17. A projectile is fired from ground level with an initial velocity of 25 m/s at an angle of 28° with the horizontal. How long will it take for the projectile to reach the ground?
- a. 4.5 seconds
 - b. 1.4 seconds
 - c. 2.4 seconds
 - d. 0.7 second

Short Answer

18. Use a ruler and a protractor to find $2\vec{b} - \vec{c}$.



19. Find the ordered pair that represents the vector from $B(9, 3)$ to $C(-9, -3)$.
20. Find an ordered pair that represents $6\vec{v} - 9\vec{w}$ if $\vec{v} = \langle 4, 2 \rangle$ and $\vec{w} = \langle 5, -5 \rangle$.
21. Find the inner product and tell whether the vectors are perpendicular. $\vec{g} = \langle 4, 6 \rangle$, $\vec{f} = \langle -1, 4 \rangle$
22. Forces of 16 pounds and 18 pounds act on an object at an angle of 120° . Find the magnitude of the resultant force.
23. Without the wind, a plane would fly due east at a rate of 190 mph. The wind is blowing southeast at a rate of 40 mph. The wind is blowing at a 45° angle from due east. What is the actual speed of the plane with the wind?
24. The resultant of two forces acting on a body has a magnitude of 32 pounds. The angles between the resultant and the forces are 72° and 46° . Find the magnitude of the larger force.
25. The resultant of two forces acting on a body has a magnitude of 50 pounds. The angle between the 24-pound force and the resultant is 50° . Find the magnitude of the other force.

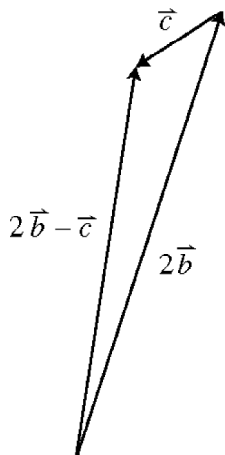
26. Without the wind, a plane would fly due east at a rate of 190 mph. The wind is blowing southeast at a rate of 40 mph. The wind is blowing at a 45° angle from due east. How far off of the due east path does the wind blow the plane?
27. Find parametric equations for the line parallel to $\vec{r} = \langle 3, 7 \rangle$ and passing through $P(3, 3)$.
28. Write an equation in slope-intercept form of the line with the given parametric equations.
 $x = 9t + 1$
 $y = 5t - 5$
29. Graph the line from its parametric form.
 $x = -4 + 3t$
 $y = 3 + 6t$
30. A rock is tossed at an initial velocity of 30 m/s at an angle of 10° with the ground. After 0.5 second, how far has the rock traveled horizontally and vertically?
31. A toy rocket is launched at an initial velocity of 50 ft/s at an angle of 75° with the horizontal. How long will it take for the rocket to travel 15 feet horizontally?
32. A golf ball is hit with an initial velocity of 160 ft/s at an angle of 28° with the horizontal. After 1.6 seconds, how far has the golf ball traveled horizontally and vertically?
33. A discus is thrown from a height of 4 feet with an initial velocity of 65 ft/s at an angle of 44° with the horizontal. How long will it take for the discus to reach the ground?
34. A projectile is fired from ground level with an initial velocity of 35 m/s at an angle of 35° with the horizontal. How long will it take for the projectile to reach the ground?

**Vector Test Review
Answer Section**

MULTIPLE CHOICE

1. D
2. A
3. B
4. B
5. A
6. C
7. B
8. C
9. B
10. A
11. D
12. B
13. B
14. D
15. C
16. A
17. C

SHORT ANSWER



18.

19. $\overrightarrow{BC} = (-18, -6)$

20. $\langle -21, 57 \rangle$

21. $\vec{g} \cdot \vec{f} = 20$; \vec{g} and \vec{f} are not perpendicular.

22. 17.1 pounds

23. 220.1 mph

24. 34.5 pounds

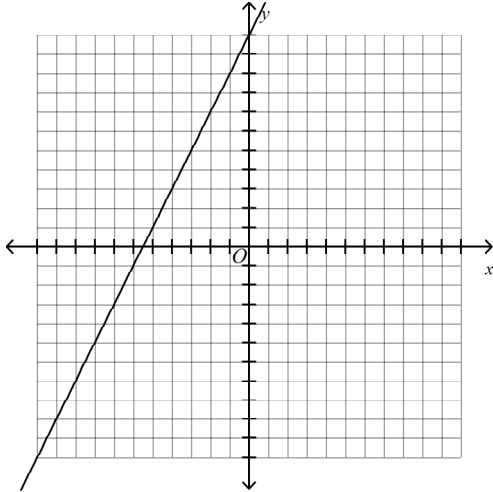
25. 39.2 pounds

26. 7.4°

27. $x = 3 + 3t, y = 3 + 7t$

28.

$$y = \frac{5}{9}x - \frac{50}{9}$$



- 29.
30. 14.8 m horizontally and 1.4 m vertically
31. 1.2 seconds
32. 226.0 feet horizontally and 79.2 feet vertically
33. 2.9 seconds
34. 4.1 seconds