

Chapter 6

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the component form and magnitude of the indicated vector.

- 1) Given that $P = (2, 4)$ and $Q = (10, 7)$, find the component form and magnitude of the vector \overrightarrow{PQ} . 1) _____
 A) $\langle 8, 3 \rangle, 73$ B) $\langle -8, -3 \rangle, \sqrt{73}$ C) $\langle 8, 3 \rangle, \sqrt{73}$ D) $\langle -8, -3 \rangle, 73$

Find the component form of the indicated vector.

- 2) Let $u = \langle -7, 4 \rangle, v = \langle 8, -6 \rangle$. Find $-6u + 4v$. 2) _____
 A) $\langle 18, 8 \rangle$ B) $\langle 10, 0 \rangle$ C) $\langle 74, -48 \rangle$ D) $\langle -6, -8 \rangle$

Find the unit vector in the direction of the given vector. Write your answer in the indicated form.

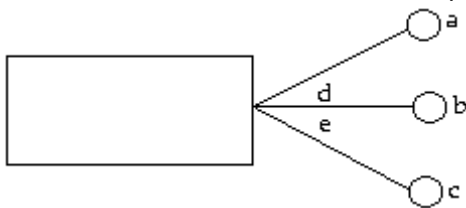
- 3) Let $u = \langle 2, 3 \rangle$. Find the unit vector in the direction of u , and write your answer as a linear combination of the standard unit vectors i and j . 3) _____
 A) $\frac{2}{\sqrt{13}}i + \frac{3}{\sqrt{13}}j$ B) $\frac{2}{13}i + \frac{3}{13}j$ C) $\frac{2}{5}i + \frac{3}{5}j$ D) $i + j$

Find the magnitude and direction angle for the following vector. Give the direction angle as an angle in $[0^\circ, 360^\circ)$ rounded to the nearest tenth.

- 4) $\langle 10, -11 \rangle$ 4) _____
 A) $\sqrt{221}, 312.3^\circ$ B) $\sqrt{221}, 132.3^\circ$ C) $\sqrt{221}, 137.7^\circ$ D) $\sqrt{221}, 317.7^\circ$

Solve the problem.

- 5) Determine the resultant effect of three people pulling on a car as shown in the drawing. 5) _____



$a = 95.0 \text{ lb}, b = 45.0 \text{ lb}, c = 41.0 \text{ lb}, d = 18^\circ, e = 19^\circ$

Round results to an appropriate number of significant digits.

- A) 175 lb $\angle 5^\circ$ B) 106 lb $\angle 24^\circ$ C) 179 lb $\angle 14^\circ$ D) 98 lb $\angle 9^\circ$

Find a · b.

- 6) $a = \langle 5, -2 \rangle, b = \langle 7, 5 \rangle$ 6) _____
 A) $\langle 35, -10 \rangle$ B) 25 C) 45 D) $\langle 12, 3 \rangle$

Find the angle between the given vectors to the nearest tenth of a degree.

- 7) $u = \langle 8, -2 \rangle, v = \langle 9, 3 \rangle$ 7) _____
 A) 42.5° B) 32.5° C) 16.3° D) 6.3°

Find the rectangular coordinates of the point with the given polar coordinates.

- 8) $(\sqrt{3}, \pi/6)$ 8) _____
 A) $\left(\frac{3}{2}, \frac{\sqrt{3}}{2}\right)$ B) $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ C) $\left(\frac{\sqrt{3}}{2}, \frac{3}{2}\right)$ D) $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

Determine two pairs of polar coordinates for the point with $0^\circ \leq \theta < 360^\circ$.

9) $(4\sqrt{3}, 12)$

A) $(8\sqrt{3}, 30^\circ), (-8\sqrt{3}, 330^\circ)$

C) $(8\sqrt{3}, 30^\circ), (-12\sqrt{3}, 330^\circ)$

B) $(8\sqrt{3}, 60^\circ), (-8\sqrt{3}, 240^\circ)$

D) $(8\sqrt{3}, 300^\circ), (-8\sqrt{3}, 60^\circ)$

9) _____

Find an equivalent equation in polar coordinates.

10) $x^2 + y^2 - 4x = 0$

A) $r = 4 \sin \theta$

C) $r \sin^2 \theta = 4 \cos \theta$

B) $r \cos^2 \theta = 4 \sin \theta$

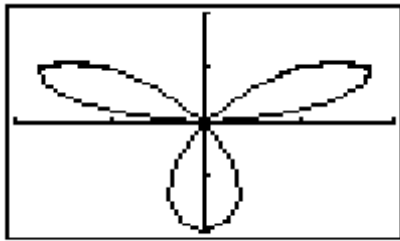
D) $r = 4 \cos \theta$

10) _____

Draw a graph of the rose curve.

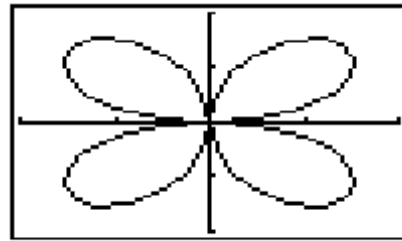
11) $r = 2 \sin 3\theta, 0 \leq \theta \leq 2\pi$

A)



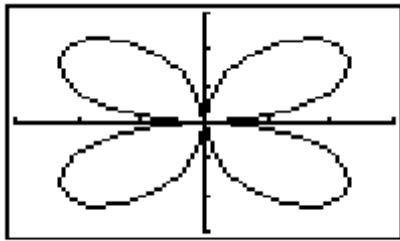
$[-2, 2]$ by $[-2, 2]$

B)



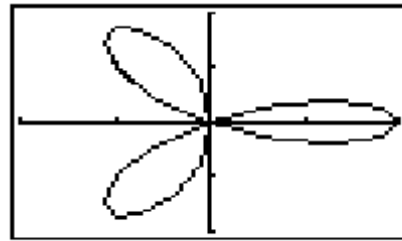
$[-2, 2]$ by $[-2, 2]$

C)



$[-2, 2]$ by $[-2, 2]$

D)

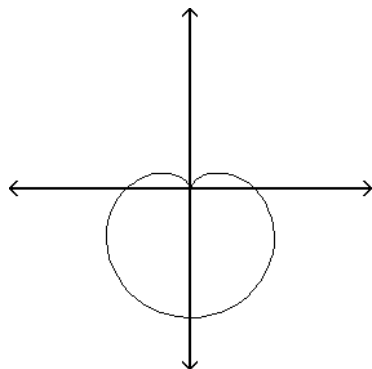


$[-2, 2]$ by $[-2, 2]$

11) _____

The graph of a limaçon curve is given. Without using your graphing calculator, determine which equation is correct for the graph.

12)



$[-5, 5]$ by $[-5, 5]$

A) $r = 2 - 2 \sin \theta$

B) $r = 1 - 3 \sin \theta$

C) $r = 2 + 2 \sin \theta$

D) $r = 3 - 2 \sin \theta$

12) _____