Name_____

Chapter 6 Review Worksheet

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the triangle. Round lengths to the nearest tenth and angle measures to the nearest degree.

1) $A = 38°$
$B = 32°$
$a = 42.1$

1) _____

Two sides and an angle (SSA) of a triangle are given. Determine whether the given measurements produce one triangle, two triangles, or no triangle at all. Solve each triangle that results. Round lengths to the nearest tenth and angle measures to the nearest degree.

2) $C = 35°$, $a = 18.7$, $c = 16.1$

2) _____

3) $B = 88°$, $b = 2$, $a = 23$

3) _____

Find the area of the triangle having the given measurements. Round to the nearest square unit.

4) A = 37°, b = 10 inches, c = 9 inches 4) _____

Use Heron's formula to find the area of the triangle. Round to the nearest square unit.

5) a = 10 yards, b = 11 yards, c = 15 yards 5) _____

Solve the problem.

6) Two tracking stations are on the equator 127 miles apart. A weather balloon is located on a bearing of N36°E from the western station and on a bearing of N13°W from the eastern station. How far is the balloon from the western station? Round to the nearest mile. 6) _____

Solve the triangle. Round lengths to the nearest tenth and angle measures to the nearest degree.

7) a = 6, c = 11, B = 109° 7) _____

8) a = 7, b = 7, c = 5 8) _____

Solve the problem.

9) Two sailboats leave a harbor in the Bahamas at the same time. The first sails at 25 mph in a direction 320°. The second sails at 30 mph in a direction 200°. Assuming that both boats maintain speed and heading, after 4 hours, how far apart are the boats? 9) _____

Find another representation, (r, θ), for the point under the given conditions.

10) $\left(5, \frac{\pi}{6}\right)$, $r < 0$ and $2\pi < \theta < 4\pi$ 10) _____

Polar coordinates of a point are given. Find the rectangular coordinates of the point. Give exact answer.

11) (–3, 120°) 11) _____

The rectangular coordinates of a point are given. Find polar coordinates of the point. Express θ in radians.

12) $(4, -4\sqrt{3})$ 12) _____

Convert the rectangular equation to a polar equation that expresses r in terms of θ.

13) $x = 4$ 13) _____

14) $x^2 + y^2 = 16$ 14) _____

15) $8x - 3y + 10 = 0$ 15) _____

Convert the polar equation to a rectangular equation.

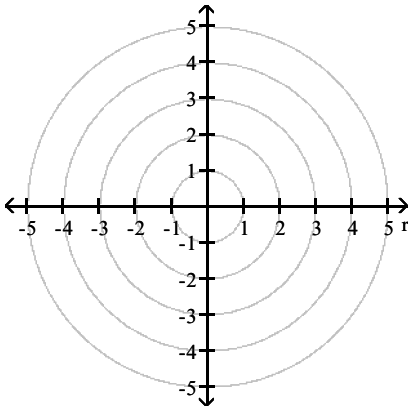
16) $r = 5$ 16) _____

17) $r = -3 \cos \theta$ 17) _____

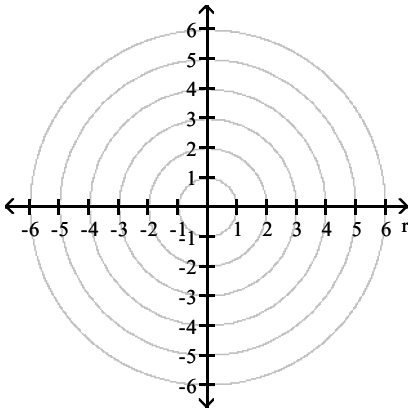
18) $r = 8 \cos \theta + 9 \sin \theta$ 18) _____

Graph the polar equation.

19) $r = 2 + 2\sin \theta$ 19) _____



20) $r = 4 \sin 2\theta$ 20) _____



Write the complex number in polar form. Express the argument in radians.

21) $-5\sqrt{3} - 5i$ 21) _____

Write the complex number in polar form. Express the argument in degrees.

22) $-6 + 8i$ 22) _____

Write the complex number in rectangular form. Give exact answer

23) $5(\cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3})$ 23) _____

Find the product of the complex numbers. Leave answer in polar form.

24) $z_1 = 8\left(\cos \frac{\pi}{6} + i \sin \frac{\pi}{6}\right)$ 24) _____

$z_2 = 3\left(\cos \frac{\pi}{2} + i \sin \frac{\pi}{2}\right)$

25) $z_1 = 2 + 2i$
$z_2 = \sqrt{3} - i$ 25) _____

Find the quotient $\frac{z_1}{z_2}$ of the complex numbers. Leave answer in polar form.

26) $z_1 = 8\left(\cos\frac{\pi}{2} + i\sin\frac{\pi}{2}\right)$
$z_2 = 3\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$ 26) _____

Use DeMoivre's Theorem to find the indicated power of the complex number. Write the answer in rectangular form.

27) $\left[3(\cos 15° + i\sin 15°)\right]^4$ 27) _____

28) $(-3 + 3i\sqrt{3})^3$ 28) _____

Find the specified vector or scalar.

29) $\mathbf{u} = -3\mathbf{i} - 6\mathbf{j}$, $\mathbf{v} = 6\mathbf{i} + 8\mathbf{j}$; Find $\mathbf{u} + \mathbf{v}$. 29) _____

30) $\mathbf{u} = -2\mathbf{i} - 7\mathbf{j}$ and $\mathbf{v} = -4\mathbf{i} - 21\mathbf{j}$; Find $\|\mathbf{v} - \mathbf{u}\|$. 30) _____

Find the unit vector that has the same direction as the vector v.

31) $\mathbf{v} = 5\mathbf{i} - 12\mathbf{j}$ 31) _____

32) $\mathbf{v} = -8\mathbf{j}$ 32) _____

Write the vector v in terms of i and j whose magnitude $\|\mathbf{v}\|$ and direction angle θ are given. Give exact answer.

33) $\|\mathbf{v}\| = 10,\ \theta = 120°$ 33) _____

34) $\|\mathbf{v}\| = 7,\ \theta = 225°$ 34) _____

Solve the problem.

35) The magnitude and direction of two forces acting on an object are 65 pounds, N60°E, and 35 pounds, S45°E, respectively. Find the magnitude, to the nearest hundredth of a pound, and the direction angle, to the nearest tenth of a degree, of the resultant force. 35) _____

Use the given vectors to find the specified scalar.

36) $\mathbf{u} = 6\mathbf{i} + 5\mathbf{j}$, $\mathbf{v} = 6\mathbf{i} - 9\mathbf{j}$, $\mathbf{w} = 7\mathbf{i} - 3\mathbf{j}$; Find $\mathbf{u} \cdot (\mathbf{v} + \mathbf{w})$. 36) _____

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

37) $\mathbf{u} = -\mathbf{i} + 6\mathbf{j}$, $\mathbf{v} = 4\mathbf{i} - 4\mathbf{j}$ 37) _____

Use the dot product to determine whether the vectors are parallel, orthogonal, or neither.

38) $\mathbf{v} = \mathbf{i} + \sqrt{3}\mathbf{j}$, $\mathbf{w} = \mathbf{i} - 4\mathbf{j}$ 38) _____

39) $\mathbf{v} = 3\mathbf{i} - \mathbf{j}$, $\mathbf{w} = 6\mathbf{i} - 2\mathbf{j}$ 39) _____

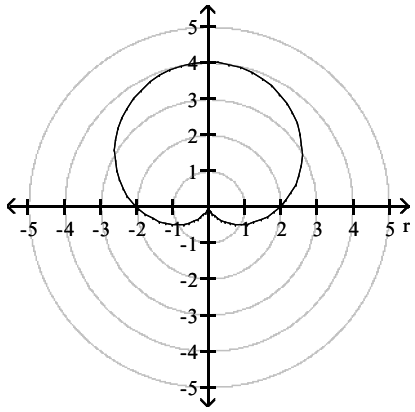
Decompose v into two vectors v_1 and v_2, where v_1 is parallel to w and v_2 is orthogonal to w.

40) $\mathbf{v} = \mathbf{i} - 4\mathbf{j}$, $\mathbf{w} = 2\mathbf{i} + \mathbf{j}$ 40) _____

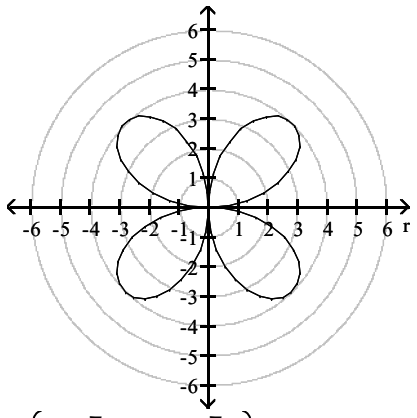
Solve the problem.

41) A force is given by the vector $\mathbf{F} = 5\mathbf{i} + 2\mathbf{j}$. The force moves an object along a straight line from the point (5, 7) to the point (18, 13). Find the work done if the distance is measured in feet and the force is measured in pounds. 41) _____

1) $C = 110°$, $b = 36.2$, $c = 64.3$
2) $A_1 = 42°$, $B_1 = 103°$, $b_1 = 27.4$;
   $A_2 = 138°$, $B_2 = 7°$, $b_2 = 3.4$
3) no triangle
4) 27 square inches
5) 55 square yards
6) 164 miles
7) $b = 14.1$, $A = 24°$, $C = 47°$
8) $A = 69°$, $B = 69°$, $C = 42°$
9) 190.8 miles
10) $\left(-5, \frac{19}{6}\pi\right)$
11) $\left(\frac{3}{2}, \frac{-3\sqrt{3}}{2}\right)$
12) $\left(8, \frac{5\pi}{3}\right)$
13) $r = \frac{4}{\cos\theta}$
14) $r = 4$
15) $r = \frac{-10}{(8\cos\theta - 3\sin\theta)}$
16) $x^2 + y^2 = 25$
17) $\left(x + \frac{3}{2}\right)^2 + y^2 = \frac{9}{4}$
18) $x^2 + y^2 = 8x + 9y$
19)



20)



21) $10\left(\cos\frac{7\pi}{6} + i\sin\frac{7\pi}{6}\right)$

22) $10(\cos 126.9° + i\sin 126.9°)$

23) $-\frac{5}{2} + \frac{5\sqrt{3}}{2}i$

24) $24\left(\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}\right)$

25) $4\sqrt{2}\left(\cos\frac{\pi}{12} + i\sin\frac{\pi}{12}\right)$

26) $\frac{8}{3}\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right)$

27) $\frac{81}{2} + \frac{81\sqrt{3}}{2}i$

28) 216

29) $3\mathbf{i} + 2\mathbf{j}$

30) $2\sqrt{50}$

31) $\mathbf{u} = \frac{5}{13}\mathbf{i} - \frac{12}{13}\mathbf{j}$

32) $\mathbf{u} = -\mathbf{j}$

33) $\mathbf{v} = -5\mathbf{i} + 5\sqrt{3}\mathbf{j}$

34) $\mathbf{v} = -\frac{7\sqrt{2}}{2}\mathbf{i} - \frac{7\sqrt{2}}{2}\mathbf{j}$

35) $\|\mathbf{F}\| = 57.04;\ \theta = -23.6°$

36) 18

37) 144.5°

38) neither

39) parallel

40) $\mathbf{v}_1 = -\frac{2}{5}(2\mathbf{i} + \mathbf{j}),\ \mathbf{v}_2 = \frac{9}{5}\mathbf{i} - \frac{18}{5}\mathbf{j}$

41) 77 ft-lb