Study Guide Spring 2011 (Test #3 will be on Wed May 4th)

8 questions will be selected from this study guide for Test #3

_____

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

Find all solutions of the equation.

1) $2 \sin x - \sqrt{3} = 0$ 1) _____

2) $\tan x \sec x = -2 \tan x$ 2) _____

Solve the equation on the interval $[0, 2\pi)$.

3) $\cos 2x = \frac{\sqrt{2}}{2}$ 3) _____

4) $\cos 2x = \frac{\sqrt{3}}{2}$ 4) _____

5) $\tan x + \sec x = 1$ 5) _____

6) $\sin^2 x + \sin x = 0$ 6) _____

Solve the equation on the interval $[0, 2\pi)$.

7) $(\tan x - 1)(\cos x + 1) = 0$ 7) _____

8) $\cos x + 2 \cos x \sin x = 0$ 8) _____

Solve the equation on the interval $[0, 2\pi)$.

9) $\sin 3x = 0$ 9) _____

10) $\sin\left(x + \frac{5\pi}{4}\right) + \sin\left(x - \frac{5\pi}{4}\right) = 1$ 10) _____

11) $\sin\left(x + \frac{7\pi}{6}\right) - \sin\left(x - \frac{7\pi}{6}\right) = 1$ 11) _____

Solve the problem.

12) A generator produces an alternating current according to the equation $I = 48 \sin 122\pi t$, where t is time in seconds and I is the current in amperes. What is the smallest time t such that $I = 24$? 12) _____

13) The range r of a projectile is given by $r = \frac{1}{32}v^2 \sin 2\theta$, where v is the initial velocity and θ is the angle of elevation. If r is to be 3000 ft and v = 500 ft/sec, what must the angle of elevation be? Give your answer in degrees to the nearest hundredth. 13) _____

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.

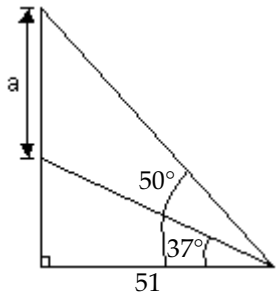
14) C = 35°, a = 18.7, c = 16.1 14) _____

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

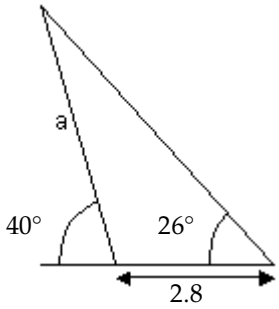
15) C = 115°, a = 5 yards, b = 7 yards 15) _____

Find a. If necessary, round your answer to the nearest hundredth.

16) 16) _____



17) 17) _____



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

18) a = 8, b = 14, c = 16 18) _____

19) b = 4, c = 5, A = 95° 19) _____

20) a = 9, b = 6, c = 4 20) _____

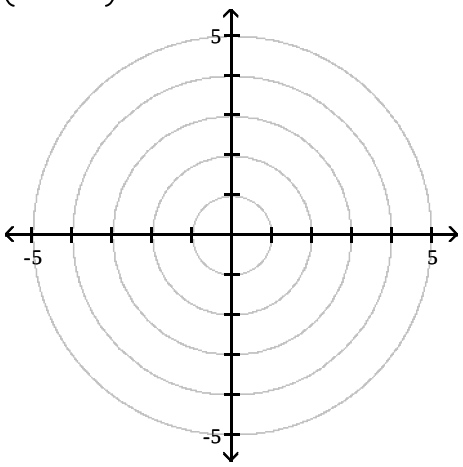
Solve the problem.

21) Two airplanes leave an airport at the same time, one going northwest (bearing 135°) at 414 mph and the other going east at 328 mph. How far apart are the planes after 3 hours (to the nearest mile)? 21) _____

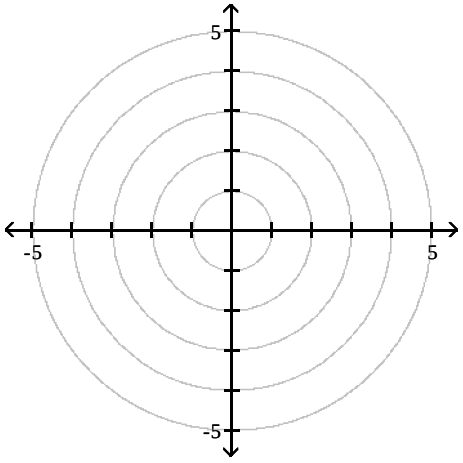
22) The distance from home plate to dead center field in Sun Devil Stadium is 409 feet. A baseball diamond is a square with a distance from home plate to first base of 90 feet. How far is it from first base to dead center field? 22) _____

Use a polar coordinate system to plot the point with the given polar coordinates.

23) $\left(-2, \frac{-3\pi}{4}\right)$ 23) _____



24) $(-4, 405°)$ 24) _____



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

25) $\left(3, \frac{\pi}{3}\right)$, $r > 0$ and $-2\pi < \theta < 0$ 25) _____

Polar coordinates of a point are given. Find the rectangular coordinates of the point.

26) $(3, -135°)$ 26) _____

27) $\left(-3, \frac{3\pi}{4}\right)$ 27) _____

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

28) $(4, -4\sqrt{3})$ 28) _____

29) $(2\sqrt{3}, 2)$ 29) _____

30) $(-5, 0)$ 30) _____

31) $(0, -\sqrt{5})$ 31) _____

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

32) $y = 6$ 32) _____

33) $x^2 + y^2 = 16$ 33) _____

34) $y^2 = 4x$ 34) _____

35) $(x - 16)^2 + y^2 = 256$ 35) _____

Convert the polar equation to a rectangular equation.

36) $r \cos \theta = 8$ 36) _____

37) $r = 4 \csc \theta$ 37) _____

38) $r = -3 \cos \theta$ 38) _____

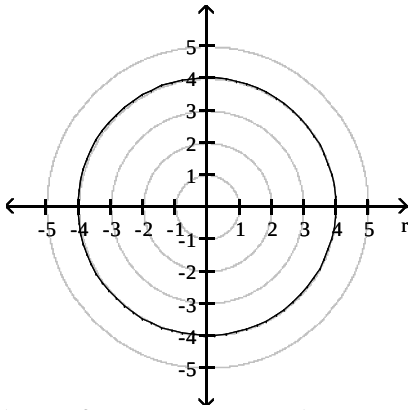
39) $r = 8 \cos \theta + 9 \sin \theta$ 39) _____

40) $r^2 \sin 2\theta = 4$ 40) _____

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

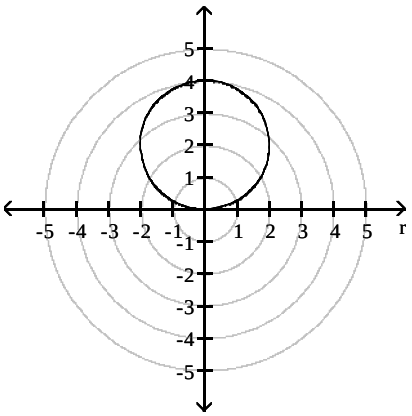
The graph of a polar equation is given. Select the polar equation for the graph.

41) 41) _____



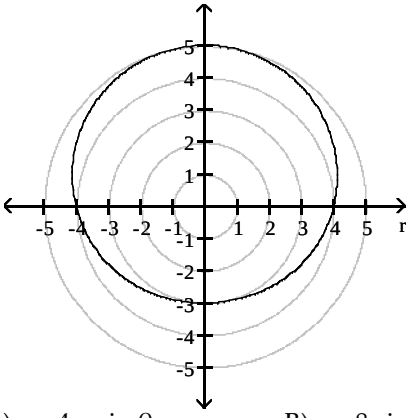
A) $r \sin \theta = 4$ B) $r = 4$ C) $r = 8 \sin \theta$ D) $r = 8 \cos \theta$

42) 42) _____



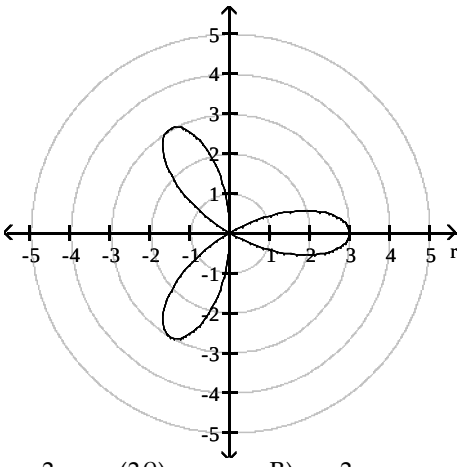
A) r = 4 sin θ B) r = 4 cos θ C) r sin θ = 2 D) r = 2

43) 43) _____



A) r = 4 + sin θ B) r = 8 sin θ C) r = 8 cos θ D) r = 4 + cos θ

44) 44) _____



A) r = 3 + cos(3θ) B) r = 3 C) r = 3 cos(3θ) D) r = 3 sin(3θ)

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

Write the complex number in rectangular form.

45) 7(cos 120° + i sin 120°) 45) _____

46) $7(\cos 34° + i \sin 34°)$ 46) _____

47) $14.60(\cos 47.6° + i \sin 47.6°)$ 47) _____

48) $5(\cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3})$ 48) _____

49) $3(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4})$ 49) _____

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

50) $z_1 = 7\left(\cos \frac{\pi}{4} + i \sin \frac{\pi}{4}\right)$ 50) _____

$z_2 = 4\left(\cos \frac{\pi}{6} + i \sin \frac{\pi}{6}\right)$