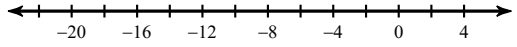
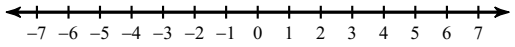
# PreComprehensive Review (Lessons 1-59)

**Solve each inequality and graph its solution.**

1) $|k + 9| \leq 12$

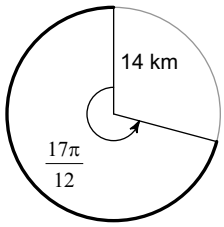



2) $|-2n| \geq 6$




**Find the length of each arc.**

3)

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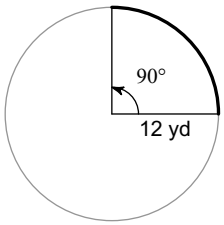
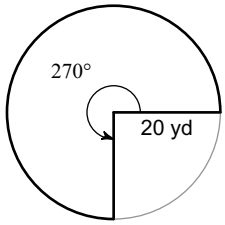



**Find the area of each sector.**

5)

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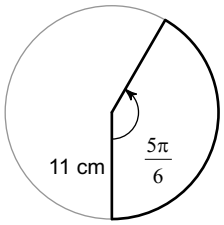



**Find a coterminal angle between 0° and 360°.**

7) $-630°$

**Find a coterminal angle between 0 and $2\pi$ for each given angle.**

8) $-\frac{7\pi}{3}$

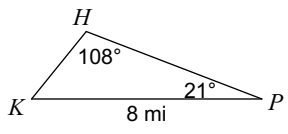
**State the quadrant in which the terminal side of each angle lies.**

9) $-490°$

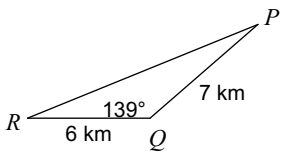
10) $-\frac{10\pi}{3}$

**Find the area of each triangle to the nearest tenth.**

11)




12)




**Use the information provided to write the standard form equation of each circle.**

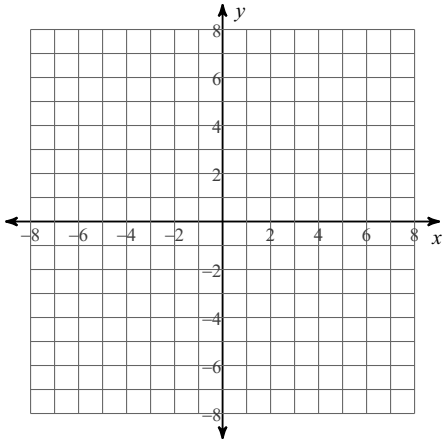
13) Center: $(-12, 2)$
Radius: $\sqrt{13}$

14) $x^2 + y^2 + 16x + 10y + 9 = 0$

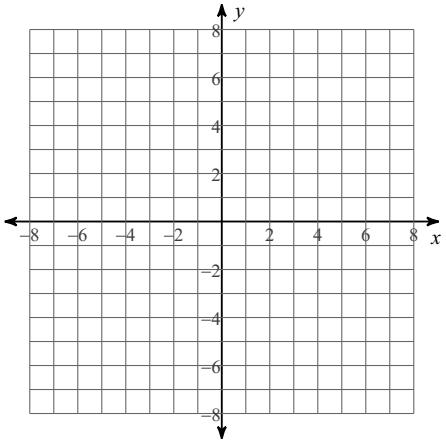
  

**Identify the center and radius of each. Then sketch the graph.**

15) $(x+4)^2+(y-2)^2=4$



16) $(x-3)^2+(y+2)^2=1$



**Solve each equation by completing the square.**

17) $10v^2-74=v$

18) $k^2=-77+17k$

**Simplify each expression.**

19) $\dfrac{\dfrac{b}{a-3}+\dfrac{9}{a-3}}{\dfrac{a-3}{b}}$

20) $\dfrac{\dfrac{4}{a+4}-\dfrac{b}{b-1}}{\dfrac{4}{a+4}+\dfrac{4}{b-1}}$

**Simplify.**

21) $\dfrac{-8-7i}{-6+5i}$

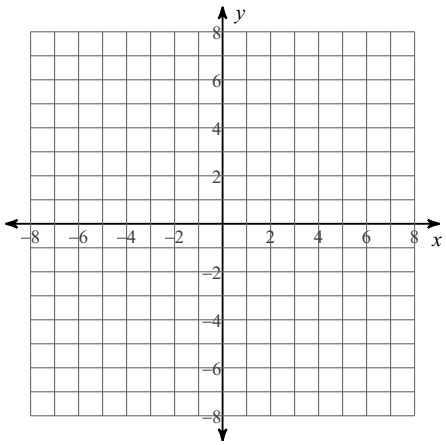
22) $\dfrac{-6-i}{-5+2i}$

23) $\dfrac{3}{5+\sqrt{10}}$

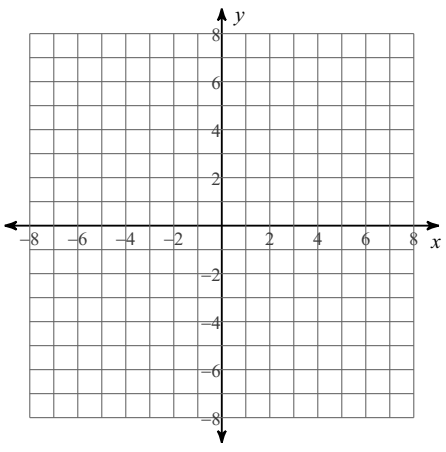
24) $-\dfrac{7}{\sqrt{5}-4}$

**Identify the vertex, axis of symmetry, direction of opening, min/max value, y-intercept, and x-intercepts of each. Then sketch the graph.**

25) $f(x)=(x-1)^2+4$



26) $f(x)=-x(x+2)$



**Use the information provided to write the vertex form equation of each parabola.**

27) $y = -x^2 + 12x - 34$

28) $y = 4x^2 - 16x + 19$

**Identify the domain and range of each. Then sketch the graph.**

29) $y = \sqrt[3]{x - 1} - 4$

30) $y = -4 + \sqrt{x + 2}$

**Solve each equation.**

31) $3^{2b-1} = \frac{1}{81}$

32) $4^{2x} = 4^{2x-1}$

33) $6^{3m} = 36$

34) $216^{2n+2} = \frac{1}{6}$

35) $6 + \log_3 (k - 3) = 5$

36) $10 \log (x + 3) = 20$

37) $\ln x - \ln (x - 1) = 2$

38) $\log x - \log (x - 1) = 1$

**Solve each equation by factoring.**

39) $3x^2 - 26x + 35 = 0$

40) $3n^2 + 7n = 0$

**Solve each equation with the quadratic formula.**

41) $-8x^2 - 13x + 18 = -x$

42) $5x^2 - 4x = -8$

**Solve each equation. Remember to check for extraneous solutions.**

43) $\sqrt{-2 - x} = 2 + \sqrt{-6 - x}$

44) $-v + \sqrt{59 - v} = -3$

45) $\frac{4}{n-2} + \frac{n-6}{n^2-2n} = \frac{n+4}{n^2-2n}$

46) $\frac{x+3}{x^2-3x} + \frac{3}{x-3} = \frac{x+1}{x^2-3x}$

**Solve each equation for $0 \le \theta < 360$.**

47) $\frac{6 - 2\sqrt{3}}{3} = 2 + \csc \theta$

48) $5 + \cos 3\theta = \frac{11}{2}$

**Solve each equation for $0 \le \theta < 2\pi$.**

49) $1 = 1 + \cot (\theta + \pi)$

50) $3\sqrt{3} = -3\tan 3\theta$

**Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.**

51) $\left( \frac{a^{\frac{1}{2}} b^{\frac{3}{2}}}{a^{\frac{3}{2}} b^{\frac{7}{4}} \cdot ab} \right)^{-1}$

52) $\frac{y^3 \cdot yx^{-2}}{\left( x^{\frac{1}{2}} y^{-\frac{4}{3}} \right)^2}$

**Evaluate each function.**

53) $w(n) = n^2 + 3n$; Find $w(-7)$

54) $g(x) = 2x + 1$; Find $g(-2)$

55) $f(x) = x^3 - 4x^2$; Find $f(-3x)$

56) $f(n) = n^2 + 1$; Find $f(n + 4)$

**Find the inverse of each function.**

57) $f(x) = \dfrac{4}{x - 2} - 3$

58) $f(x) = 1 + 2x^5$

**Perform the indicated operation.**

59) $h(x) = 3x - 5$
$g(x) = x^2 - 5x$
Find $(2h - 4g)(x)$

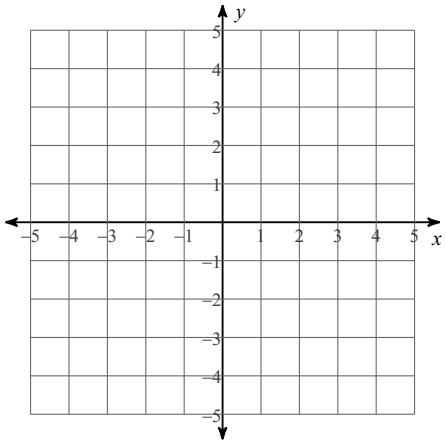
60) $g(n) = n^2 + 4n$
$h(n) = 2n + 2$
Find $(g \circ h)(n)$

61) $h(n) = n^2 - 4n$
$g(n) = 2n - 2$
Find $(h \circ g)(-1)$

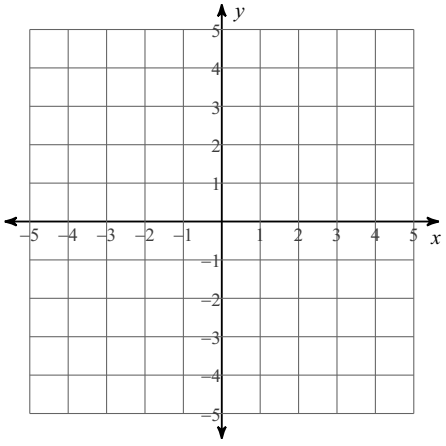
62) $f(x) = x^2 - 4$
Find $(f \circ f)(0)$

**Sketch the solution to each system of inequalities.**

63) $y < 2x - 3$
$y \geq -x + 3$

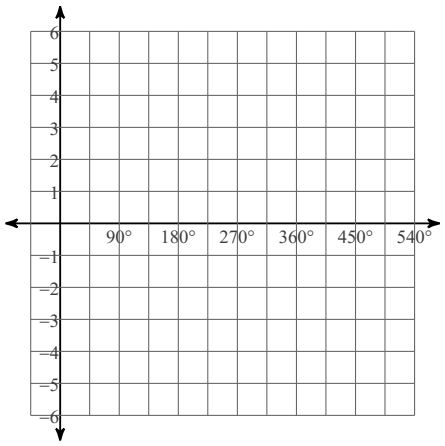



64) $y \leq -2x + 3$
$y \leq \dfrac{1}{2}x - 2$

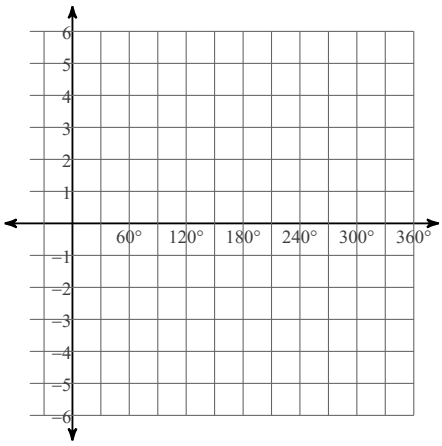


**Using degrees, find the amplitude and period of each function. Then graph.**

65) $y = 4\sin(\theta + 135) - 2$

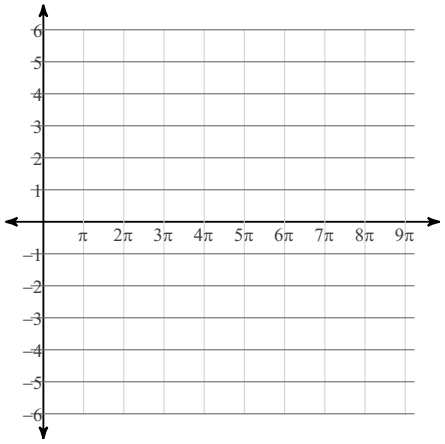



66) $y = 4\cos 2\theta + 1$

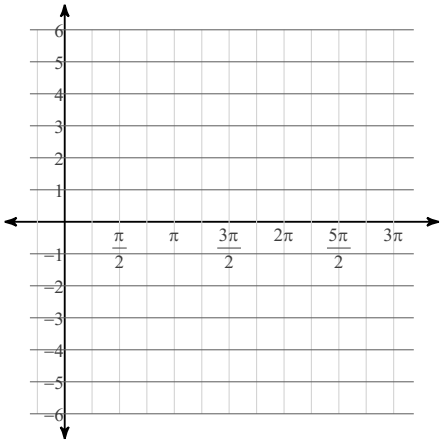



**Using radians, find the amplitude and period of each function. Then graph.**

67) $y = 3\sin\frac{\theta}{3} + 1$




68) $y = -2 + 4\cos\left(\theta - \frac{3\pi}{2}\right)$




**Write the point-slope form of the equation of the line described.**

69) through: $(3, -4)$, parallel to $y = \frac{1}{3}x - 2$

**Write the standard form of the equation of the line described.**

70) through: $(4, 3)$, perp. to $y = -4x - 5$

**Write the slope-intercept form of the equation of the line described.**

71) through: $(5, -4)$, perp. to $y = \frac{5}{4}x - 1$

**Expand each logarithm.**

72) $\log_6\left(a^3b^5\right)$

73) $\ln\left(c\sqrt[3]{a \cdot b}\right)$

**Condense each expression to a single logarithm.**

74) $18\log_9 x - 6\log_9 y$

75) $6\ln w + \frac{\ln u}{3}$

76) How many kg of cane molasses which costs \$1/kg must be added to 12 kg of beet molasses which costs \$4/kg to make Jacob's Premium Molasses which costs \$3/kg?

77) 6 kg of mixed nuts containing 20% peanuts were mixed with 9 kg of peanuts. What percent of the new mixture is peanuts?

78) 8 lb of brand X coffee which costs \$16/lb were combined with 10 lb of brand Y coffee which costs \$25/lb. Find the cost per lb of the mixture.

79) Ashley asked you to make 10 L of fruit punch that contains 40% fruit juice by mixing together some amount of Brand A fruit punch and some amount of Brand B fruit punch. Brand A contains 55% fruit juice and Brand B contains 30% fruit juice. How much of each do you need?

**Find the number of unique permutations of the letters in each word.**

80) SCALLOPS

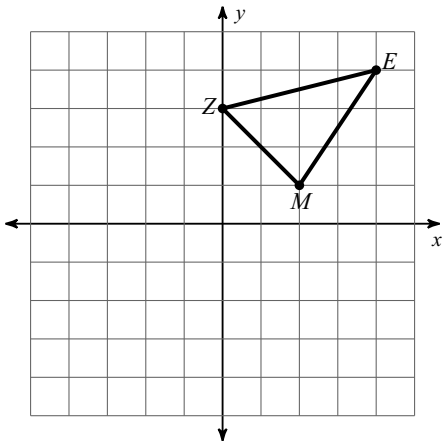
81) EQUINOX

82) Willie's school is selling tickets to a fall musical. On the first day of ticket sales the school sold 14 adult tickets and 10 student tickets for a total of \$152. The school took in \$36 on the second day by selling 2 adult tickets and 5 student tickets. What is the price each of one adult ticket and one student ticket?

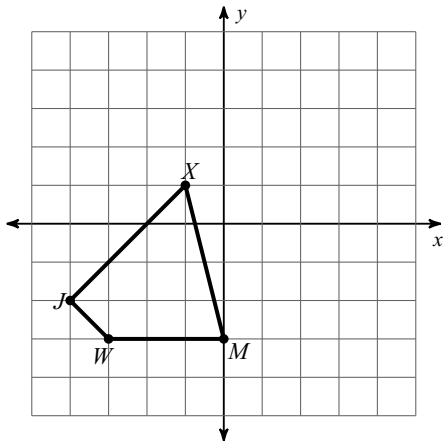
83) The sum of the digits of a certain two-digit number is 1. Reversing its digits decreases the number by 9. Find the number.

**Graph the image of the figure using the transformation given.**

84) translation: 3 units left and 6 units down




85) reflection across the x-axis




**Convert each degree measure into radians and each radian measure into degrees.**

86) $-\frac{8\pi}{3}$

87) 675°

88) 100°

89) $\frac{5\pi}{6}$

**Find the exact value of each trigonometric function.**

90) cot 540°

91) cos 585°

92) $\tan \frac{7\pi}{2}$

93) $\csc \frac{21\pi}{4}$

94) $\sec \frac{5\pi}{4}$

95) $\sin \frac{17\pi}{4}$

**Find the value of the trig function indicated.**

96) Find sec $\theta$ if $\sin \theta = \frac{2\sqrt{13}}{13}$

97) Find cot $\theta$ if $\csc \theta = \frac{5}{3}$

98) Mark left the airport driving toward the lake three hours before Bill. Bill drove in the opposite direction going 25 mph faster then Mark for three hours after which time they were 282 mi. apart. Find Mark's speed.

99) Ashley made a trip to the ferry office and back. The trip there took three hours and the trip back took five hours. She averaged 20 mph faster on the trip there than on the return trip. Find Ashley's average speed on the outbound trip.

100) Scott left school and drove toward the dump at an average speed of 40 mph. Jose left two hours later and drove in the opposite direction with an average speed of 30 mph. How long does Jose need to drive before they are 220 mi. apart?

101) A jet left Paris and flew north at an average speed of 336 km/h. A passenger plane left one hour later and flew in the same direction but with an average speed of 420 km/h. How long did the jet fly before the passenger plane caught up?

**Solve each question. Round your answer to the nearest hundredth.**

102) Working together, Abhasra and Jaidee can clean an attic in 6.16 hours. Had she done it alone it would have taken Jaidee 11 hours. Find how long it would take Abhasra to do it alone.

103) It takes Lea 13 hours to pick forty bushels of apples. Arjun can pick the same amount in 14 hours. If they worked together how long would it take them?