Algebra 2 Name_____

EOC Study Guide

Period____

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

48) $f(x) = (x-3)^2 - 25$

Describe the transformation of $f(x)$ from $g(x) = x^2$

49) $f(x) = \frac{1}{2}(x+2)^2 + 4$

Find the inverse of each function.

50) $g(x) = \frac{2 - \sqrt[3]{4x}}{2}$

51) $g(x) = -\frac{5}{6}x + \frac{5}{2}$

52) $y = 4^x - 10$

53) $y = \log_2 (x+1)$

Use the information provided to write the vertex form equation of each parabola. Then find he vertex.

54) $f(x) = -2x^2 + 16x - 39$

55) $f(x) = x^2 + 4x + 12$

Divide.

56) $(x^4 - 8x^3 - 25x^2 + 52x - 12) \div (x - 10)$

57) $(6x^4 + 8x^3 - 62x^2 + 24x - 1) \div (6x - 4)$

Evaluate each expression.

58) $\log_8 \frac{1}{2}$

59) $\log_4 16$

Use a calculator to approximate each to the nearest thousandth.

60) $\log_2 25$

61) $\log_7 27$

Condense each expression to a single logarithm.

62) $6\log_5 3 + 2\log_5 8$

63) $2\log_6 8 - 12\log_6 11$

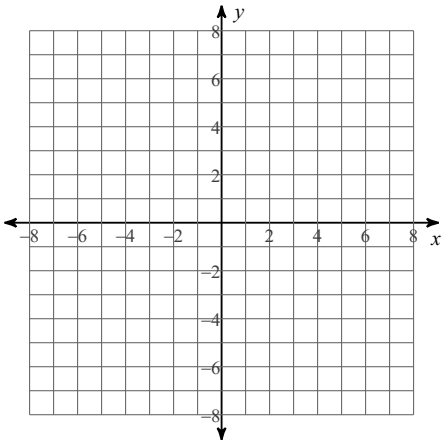
Expand each logarithm.

64) $\log_2 (c^6\sqrt{a})$

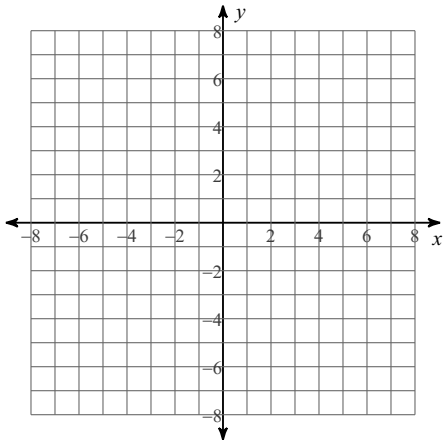
65) $\log_7 (x \cdot y \cdot z^5)$

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

66) $f(x) = \log_2 (x - 1) + 1$



67) $f(x) = \log_2 (x - 1) - 4$



Solve each equation.

68) $\log_5 x - \log_5 (x - 2) = 1$

69) $\log_5 9 + \log_5 5x^2 = 1$

Solve each equation. Round your answers to the nearest ten-thousandth.

70) $-5e^{x-10} = -28.7$

71) $e^{x-8} + 5 = 14$

72) Find the time required for an investment of \$2000 to double if the interest rate of 9.5% is compounded continuously.

73) The needle of the scale in the bulk food section of a supermarket is 25 cm long. Find the distance the tip of the needle travels when it rotates 92°.

Find the exact value of all six trigonometric functions.

74) $\theta = \dfrac{7\pi}{6}$

75) An angle whose endpoint lies at $(3, -4)$

76) simplify: $\cos^2 x \sin^2 x - \cos^2 x$

77) simplify: $\tan^2 x - \tan^2 x \sin^2 x$

78) $\tan^2 x(\sec^2 x - 1)$

79) $\dfrac{1 - \sec x}{\tan x} - \dfrac{\tan x}{1 - \sec x}$

Evaluate each arithmetic series described.

80) $\sum_{k=1}^{45} (10k - 5)$

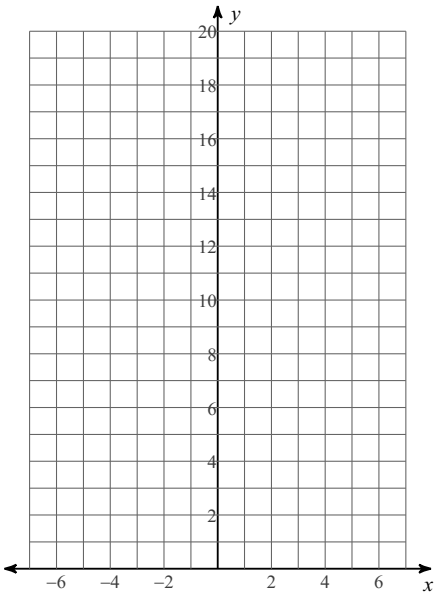
81) $\sum_{k=1}^{6} (2k - 7)$

82) To find the height of a pole, a surveyor moves 100 feet away from the base of the pole and then, from an eye-level height of 5.5 feet, measures the angle of elevation to the top of the pole to be 47°. Find the height of the pole to the nearest foot.

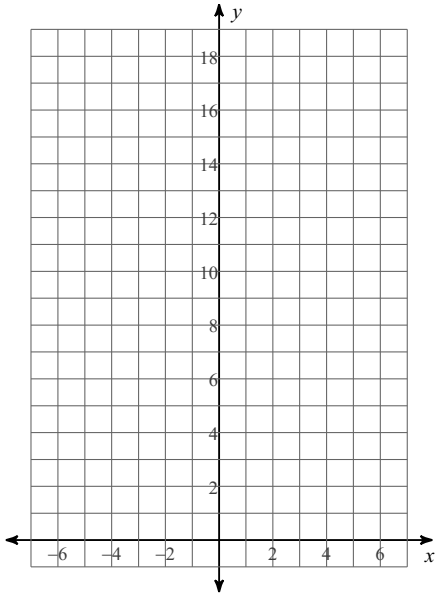
83) A 20-foot ladder makes an angle of 52° with the ground as it leans against a barn. How far up the barn does the ladder reach?

Sketch the graph of each function.

84) $f(x) = \frac{1}{2} \cdot \left(\frac{1}{6}\right)^x + 1$

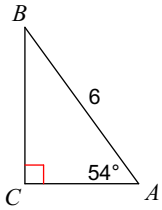


85) $f(x) = 5 \cdot 2^x - 1$



Solve each triangle. Round answers to the nearest tenth.

86)



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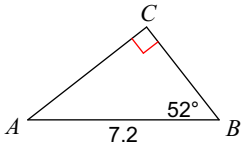

88) A pole 50 feet tall is situated at the bottom of a hill that slopes up at an angle of 21.9°. A guy wire from the top of the pole to the hillside forms an angle of 37° with the top of the pole. Find the distance from the base of the pole to the guy wire's point of attachment.

89) A group of 80 people attend a ball game. There were four times as many children as adults in the group. Set up a system of equations that represents the numbers of adults and children that attended the game and solve the system to find the number of children that were in the group.

Given the first term and the common difference of an arithmetic sequence find the term named in the problem, the explicit formula, and the recursive formula.

90) $a_1 = -22,\ d = 9$

Find a_{26}

91) $a_1 = -35,\ d = -10$

Find a_{29}

Evaluate each arithmetic series described.

92) $a_1 = 14,\ a_n = 26,\ n = 7$

93) $a_1 = 19,\ d = 8,\ n = 40$

94) $31 + 40 + 49 + 58...,\ n = 14$

95) $0 + 10 + 20 + 30...,\ n = 16$

Evaluate each geometric series described.

96) $\sum_{k=1}^{8} -2 \cdot 4^{k-1}$

97) $a_1 = -1,\ a_n = 128,\ r = -2$

Find the common ratio, the 8th term, the explicit formula, and the recursive formula.

98) 3, 15, 75, 375, ...

99) In 1988, the average cost of a ticket on a privately-owned airline was $110. This amount has increased by approximately $55 yearly. How much should you expect to pay for a ticket on this airline in the year 2003?

100) A woman made $20,000 during the first year of her new job at city hall. Each year she received a 10% raise. Find her total earnings during the first seven years on the job.

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

101) $3 + \tan\theta = 2$

102) $0 = 4\tan\theta$

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

103) $2\sqrt{3} = -4\cos\theta$

104) $-4 + \tan\theta = -4$

105) State all three pythagorean identies

106) State all reciprocal identities.

Sketch two cycles of the graph of the functions.

107) Sketch two cycles of the graph of the function $y = 3\cos\theta - 1$

108) $y = -2 + \frac{1}{2} \cdot \sin 4\theta$

Algebra 2 Name_____

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Period____

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

48) $f(x) = (x-3)^2 - 25$ Vertex: $(3, -25)$
Axis of Sym.: $x = 3$
Opens: Up
Min value = –25
y-int: –16
x-int: 8 and –2

Describe the transformation of $f(x)$ from $g(x) = x^2$

49) $f(x) = \frac{1}{2}(x+2)^2 + 4$ vertical compression by $\frac{1}{2}$
shift 2 to the left and 4 up

Find the inverse of each function.

50) $g(x) = \frac{2 - \sqrt[3]{4x}}{2}$ $g^{-1}(x) = -2(x-1)^3$

51) $g(x) = -\frac{5}{6}x + \frac{5}{2}$ $g^{-1}(x) = 3 - \frac{6}{5}x$

52) $y = 4^x - 10$ $y = \log_4(x+10)$

53) $y = \log_2(x+1)$ $y = 2^x - 1$

Use the information provided to write the vertex form equation of each parabola. Then find he vertex.

54) $f(x) = -2x^2 + 16x - 39$ $f(x) = -2(x-4)^2 - 7$
$(4, -7)$

55) $f(x) = x^2 + 4x + 12$ $f(x) = (x+2)^2 + 8$
$(-2, 8)$

Divide.

56) $(x^4 - 8x^3 - 25x^2 + 52x - 12) \div (x - 10)$
$x^3 + 2x^2 - 5x + 2 + \frac{8}{x-10}$

57) $(6x^4 + 8x^3 - 62x^2 + 24x - 1) \div (6x - 4)$
$x^3 + 2x^2 - 9x - 2 - \frac{9}{6x-4}$

Evaluate each expression.

58) $\log_8 \frac{1}{2}$ $-\frac{1}{3}$

59) $\log_4 16$ 2

Use a calculator to approximate each to the nearest thousandth.

60) $\log_2 25$ 4.644

61) $\log_7 27$ 1.694

Condense each expression to a single logarithm.

62) $6\log_5 3 + 2\log_5 8$ $\log_5(8^2 \cdot 3^6)$

63) $2\log_6 8 - 12\log_6 11$ $\log_6 \frac{8^2}{11^{12}}$

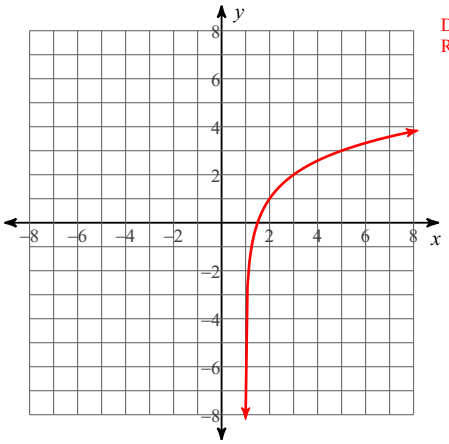
Expand each logarithm.

64) $\log_2(c^6\sqrt{a})$ $6\log_2 c + \frac{\log_2 a}{2}$

65) $\log_7(x \cdot y \cdot z^5)$ $\log_7 x + \log_7 y + 5\log_7 z$

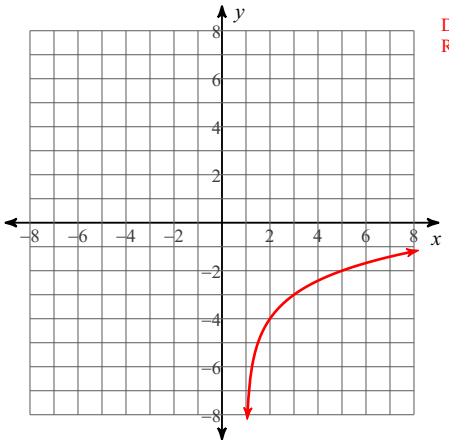
Identify the domain and range of each. Then sketch the graph.

66) $f(x) = \log_2 (x - 1) + 1$



Domain: $x > 1$
Range: All reals

67) $f(x) = \log_2 (x - 1) - 4$



Domain: $x > 1$
Range: All reals

Solve each equation.

68) $\log_5 x - \log_5 (x - 2) = 1$ $\left\{\frac{5}{2}\right\}$

69) $\log_5 9 + \log_5 5x^2 = 1$ $\left\{\frac{1}{3}, -\frac{1}{3}\right\}$

Solve each equation. Round your answers to the nearest ten-thousandth.

70) $-5e^{x-10} = -28.7$ 11.7475

71) $e^{x-8} + 5 = 14$ 10.1972

72) Find the time required for an investment of $2000 to double if the interest rate of 9.5% is compounded continuously. 7.30 years

73) The needle of the scale in the bulk food section of a supermarket is 25 cm long. Find the distance the tip of the needle travels when it rotates 92°. 40.1 cm

Find the exact value of all six trigonometric functions.

74) $\theta = \frac{7\pi}{6}$ $\sin\theta = -\frac{1}{2}$, $\csc\theta = -2$, $\cos\theta = -\frac{\sqrt{3}}{2}$, $\sec\theta = -\frac{2\sqrt{3}}{3}$, $\tan\theta = \frac{\sqrt{3}}{3}$, $\cot\theta = \sqrt{3}$

75) An angle whose endpoint lies at $(3, -4)$
$\sin\theta = -\frac{4}{5}$, $\csc\theta = -\frac{5}{4}$, $\cos\theta = \frac{3}{5}$, $\sec\theta = \frac{5}{3}$, $\tan\theta = -\frac{4}{3}$, $\cot\theta = -\frac{3}{4}$

76) simplify: $\cos^2 x \sin^2 x - \cos^2 x$ $-\cos^4 x$

77) simplify: $\tan^2 x - \tan^2 x \sin^2 x$ $\sin^2 x$

78) $\tan^2 x(\sec^2 x - 1)$ $\tan^4 x$

79) $\frac{1 - \sec x}{\tan x} - \frac{\tan x}{1 - \sec x}$ $2\cot x$

Evaluate each arithmetic series described.

80) $\sum_{k=1}^{45} (10k - 5)$ 10125

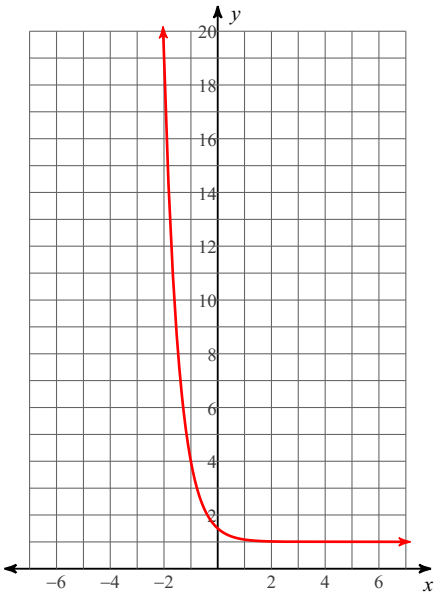
81) $\sum_{k=1}^{6} (2k - 7)$ 0

82) To find the height of a pole, a surveyor moves 100 feet away from the base of the pole and then, from an eye-level height of 5.5 feet, measures the angle of elevation to the top of the pole to be 47°. Find the height of the pole to the nearest foot. 113 ft.

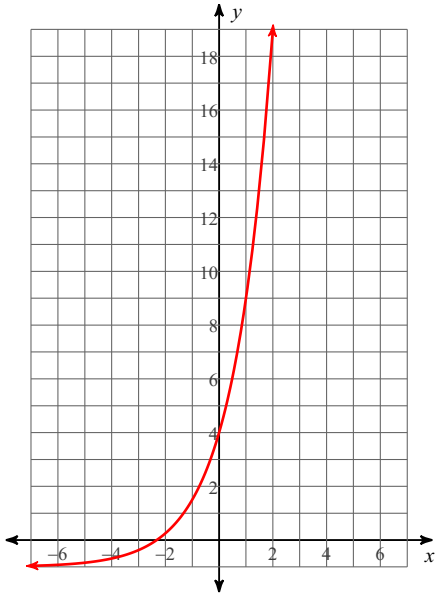
83) A 20-foot ladder makes an angle of 52° with the ground as it leans against a barn. How far up the barn does the ladder reach?
15.76 ft

Sketch the graph of each function.

84) $f(x) = \frac{1}{2} \cdot \left(\frac{1}{6}\right)^x + 1$



85) $f(x) = 5 \cdot 2^x - 1$



Solve each triangle. Round answers to the nearest tenth.

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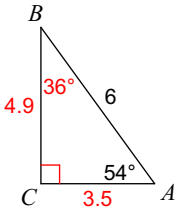

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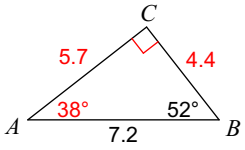


88) A pole 50 feet tall is situated at the bottom of a hill that slopes up at an angle of 21.9°. A guy wire from the top of the pole to the hillside forms an angle of 37° with the top of the pole. Find the distance from the base of the pole to the guy wire's point of attachment.

31.2 ft

89) A group of 80 people attend a ball game. There were four times as many children as adults in the group. Set up a system of equations that represents the numbers of adults and children that attended the game and solve the system to find the number of children that were in the group.

64 children

Given the first term and the common difference of an arithmetic sequence find the term named in the problem, the explicit formula, and the recursive formula.

90) $a_1 = -22,\ d = 9$ $a_{26} = 203$

Find a_{26} Explicit: $a_n = -31 + 9n$

Recursive: $a_n = a_{n-1} + 9$, $a_1 = -22$

91) $a_1 = -35,\ d = -10$ $a_{29} = -315$

Find a_{29} Explicit: $a_n = -25 - 10n$

Recursive: $a_n = a_{n-1} - 10$, $a_1 = -35$

Evaluate each arithmetic series described.

92) $a_1 = 14,\ a_n = 26,\ n = 7$ 140

93) $a_1 = 19,\ d = 8,\ n = 40$ 7000

94) $31 + 40 + 49 + 58..., \ n = 14$ 1253

95) $0 + 10 + 20 + 30..., \ n = 16$ 1200

Evaluate each geometric series described.

96) $\sum_{k=1}^{8} -2 \cdot 4^{k-1}$ –43690

97) $a_1 = -1,\ a_n = 128,\ r = -2$ 85

Find the common ratio, the 8th term, the explicit formula, and the recursive formula.

98) 3, 15, 75, 375, ... Common Ratio: $r = 5$
$a_8 = 234375$
Explicit: $a_n = 3 \cdot 5^{n-1}$
Recursive: $a_n = a_{n-1} \cdot 5$
$a_1 = 3$

99) In 1988, the average cost of a ticket on a privately-owned airline was $110. This amount has increased by approximately $55 yearly. How much should you expect to pay for a ticket on this airline in the year 2003? $935

100) A woman made $20,000 during the first year of her new job at city hall. Each year she received a 10% raise. Find her total earnings during the first seven years on the job. $189,743.42

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

101) $3 + \tan\theta = 2$ $\{135, 315\}$

102) $0 = 4\tan\theta$ $\{0, 180\}$

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

103) $2\sqrt{3} = -4\cos\theta$ $\left\{\frac{5\pi}{6}, \frac{7\pi}{6}\right\}$

104) $-4 + \tan\theta = -4$ $\{0, \pi\}$

105) State all three pythagorean identies

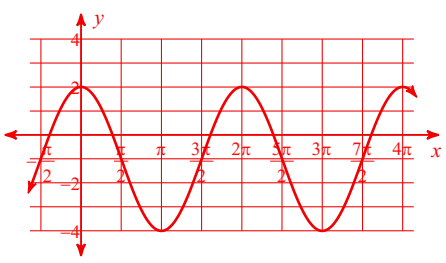
$\sin^2 x + \cos^2 x = 1$
$\sec^2 x = \tan^2 x + 1$
$\csc^2 x = \cot^2 x + 1$

106) State all reciprocal identities.

$\sin\theta = \frac{1}{\csc\theta}$
$\cos\theta = \frac{1}{\sec\theta}$
$\tan\theta = \frac{1}{\cot\theta}$

Sketch two cycles of the graph of the functions.

107) Sketch two cycles of the graph of the function $y = 3\cos\theta - 1$



108) $y = -2 + \frac{1}{2} \cdot \sin 4\theta$