

OnRamps Disc PreCal

Prerequisite Assignment

I. RADICALS - Simplify each of the following:

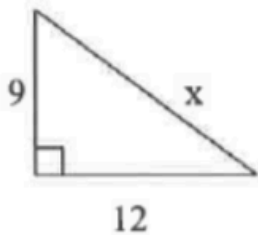
1. $\sqrt{32}$ 2. $\sqrt{(2x)^8}$ 3. $\sqrt[3]{-64}$ 4. $\sqrt{49m^2n^8}$
5. $\sqrt{\frac{11}{9}}$ 6. $(\sqrt{5} - \sqrt{6})(\sqrt{5} + \sqrt{2})$ Rationalize: 7. $\frac{1}{\sqrt{2}}$ 8. $\frac{3}{2 - \sqrt{5}}$

II. COMPLEX NUMBERS-Simplify each of the following:

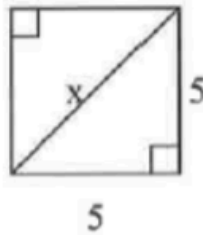
9. $\sqrt{-49}$ 10. $6\sqrt{-12}$ 11. $-6(2 - 8i) + 3(5 + 7i)$
12. $(3 - 4i)^2$ 13. $(6 - 4i)(6 + 4i)$ 14. Rationalize: $\frac{1 + 6i}{5i}$

III. GEOMETRY – Find the value of x:

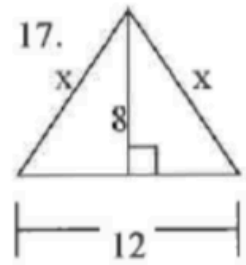
15.



16.



17.



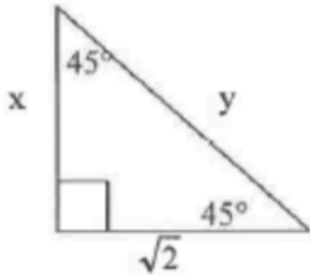
18. A square has perimeter 12 cm. Find the length of the diagonal.

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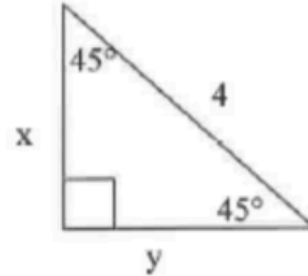
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Solve for x and y .

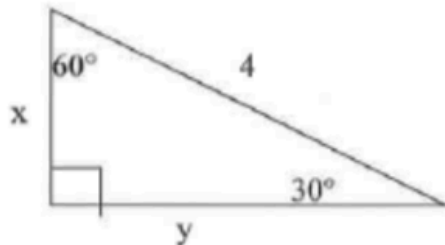
19.



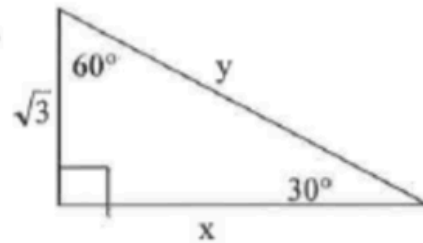
20.



21.



22.



IV. LINEAR FUNCTIONS

23. State the slope and y -intercept of the linear equation: $5x - 4y = 8$
24. Find the x and y -intercepts of the equation: $3x - 2y - 16 = -x + 6y$
25. Write the equation of the line in point-slope form that passes through $(-2, 3)$ and is perpendicular to the line $3x + 4y = -7$.
26. Write the equation of the function in point-slope form given these two values:
 $f(4) = 2$ and $f(-5) = -1$
27. Solve for z : $\frac{3}{2}(z + 5) - \frac{1}{4}(z + 24) = 0$
28. If $m - (5 - m) + (2m - 2) = -2(3 - m)$, then $m = ?$

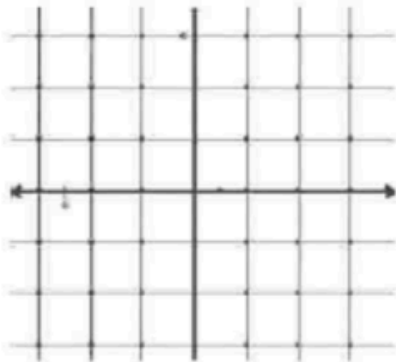
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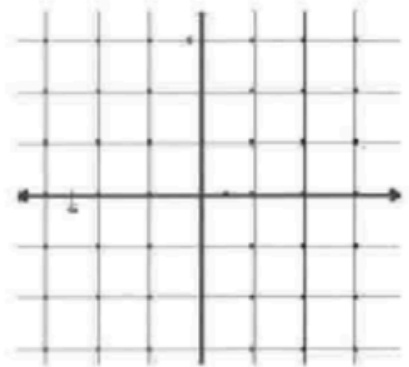
Graphing:

Graph each function, inequality, and / or system.

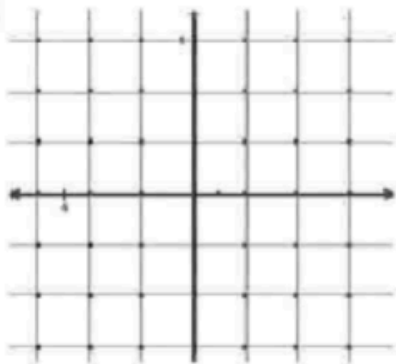
29. $3x - 4y = 12$



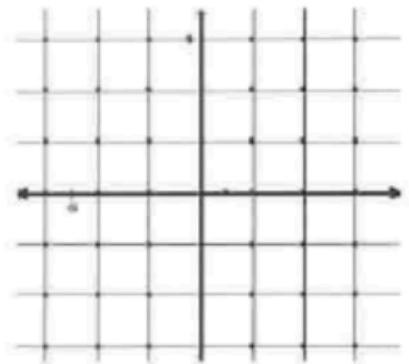
30. $\begin{cases} 2x + y = 4 \\ x - y = 2 \end{cases}$



31. $y < -4x - 2$



32. $y + 2 = |x + 1|$



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V. POLYNOMIALS

Multiply:

33. $(2x + 1)(x - 2)$

34. $(x - 5)^2$

35. $(2x + 3y)(2x - 3y)$

Factor:

36. $25x^4 - 4x^2$

37. $6x^2 + 15x - 36$

38. $2h^3 + 7h^2k - 15hk^2$

Solve:

39. $x^2 + 5x - 24 = 0$

40. $(x - 3)^2 + 9 = 25$

41. $\sqrt{x} + 1 = 41$

42. $\frac{5}{x^2} - \frac{2}{x} = -3$

43. $x^2 + 14x + 49 = 64$

Evaluate the following, given:

$$f(x) = x^2 - 6x + 2$$

44. $f(3) =$

45. $f(x + h)$

46. $5[f(x + 2)]$

47. For several mammals, the gestation period, in days, and the average life span, in years, is recorded below:

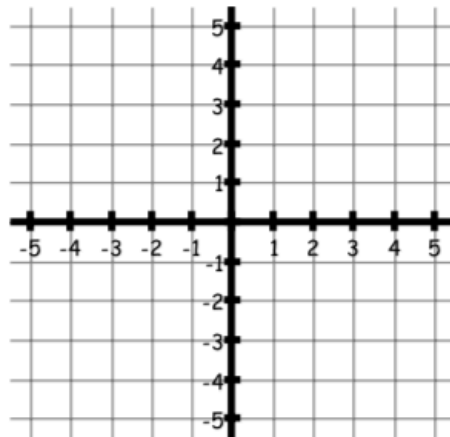
Animal	Gestation (days)	Average Life Span (years)
Rabbit	31	7
Dog	60	11.4
Squirrel	44	9
Wolf	62	11.6

- Using your calculator's regression capabilities to find $L(G)$, the linear function of best fit for this data. Write decimal values correct to three decimal places.
- Use $L(G)$ to predict the average life span of a kangaroo with a gestational period of 35 days. Give your answers correct to three decimal places and include units of measure.
- What are the units of the L intercept? What is the meaning of the L intercept? Could this situation occur?
- What are the units of the slope? What is the meaning of the slope in the context of this problem?
- What is the meaning of $(38, 8)$ in the context of this problem?

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48. $f(x) = 2$



Max: _____

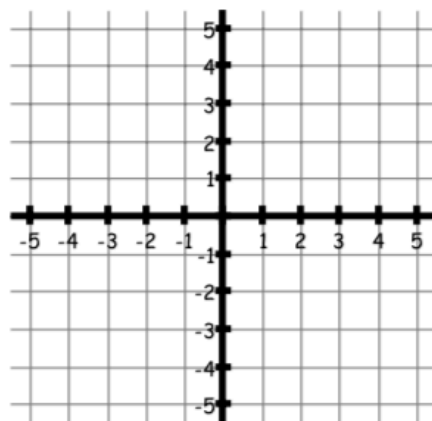
Min: _____

Domain: _____

Range: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

49. $f(x) = x$



Max: _____

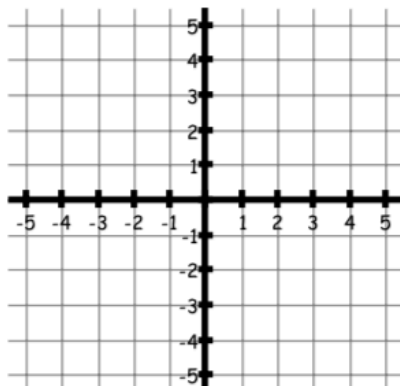
Min: _____

Domain: _____

Range: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

50. $f(x) = |x|$



Max: _____

Min: _____

Domain: _____

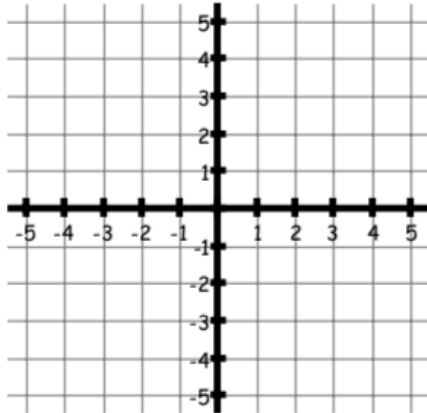
Range: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

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51. $f(x) = x^2$



Max: _____

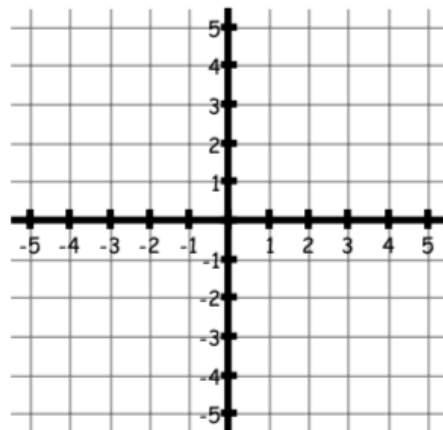
Min: _____

Domain: _____

As $x \rightarrow -\infty, f(x) \rightarrow$ _____ As $x \rightarrow \infty, f(x) \rightarrow$ _____

Range: _____

52. $f(x) = x^3$



Max: _____

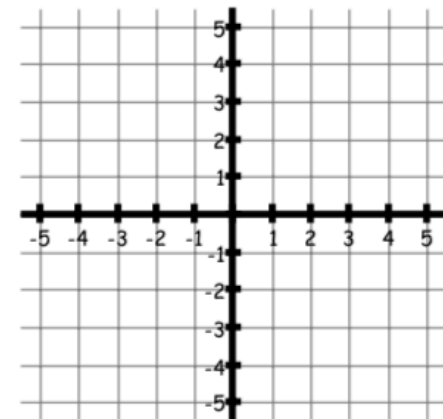
Min: _____

Domain: _____

As $x \rightarrow -\infty, f(x) \rightarrow$ _____ As $x \rightarrow \infty, f(x) \rightarrow$ _____

Range: _____

53. $f(x) = \sqrt{x}$



Max: _____

Min: _____

Domain: _____

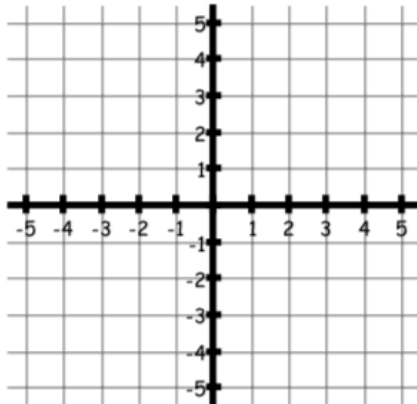
As $x \rightarrow -\infty, f(x) \rightarrow$ _____ As $x \rightarrow \infty, f(x) \rightarrow$ _____

Range: _____

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54. $f(x) = e^x$



Max: _____

Min: _____

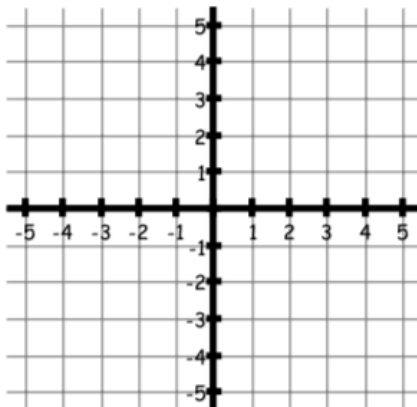
Domain: _____

Range: _____

Hor. Asymptote: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

55. $f(x) = e^{-x}$



Max: _____

Min: _____

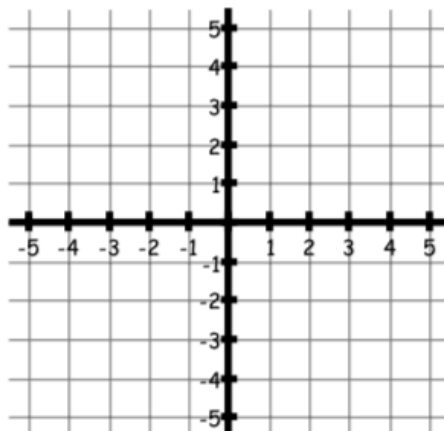
Domain: _____

Range: _____

Hor. Asymptote: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

56. $f(x) = \ln x$



Max: _____

Min: _____

Domain: _____

Range: _____

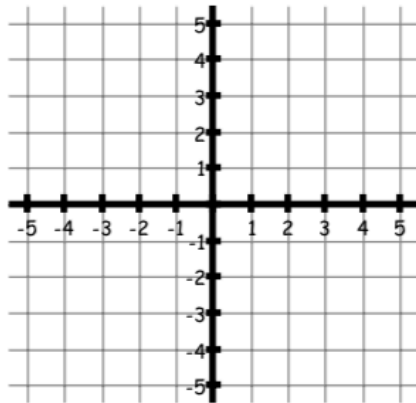
Vert. Asymptote: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____ As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

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57. $f(x) = \frac{1}{x}$



Max: _____

Min: _____

Domain: _____

Range: _____

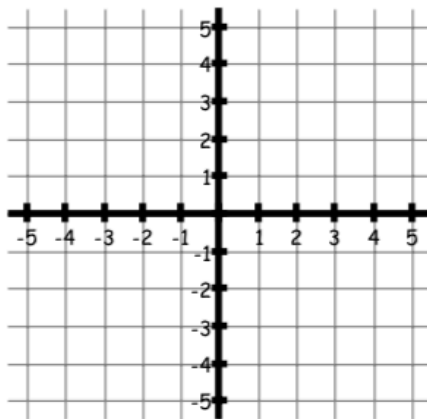
Hor. Asymptote: _____

Vert. Asymptote: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____

As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

58. $f(x) = \frac{1}{x^2}$



Max: _____

Min: _____

Domain: _____

Range: _____

Hor. Asymptote: _____

Vert. Asymptote: _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____

As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

Exponential and Logarithmic Properties

59.

$\ln 1 =$ _____

$\ln e =$ _____

$\ln e^2 =$ _____

$\ln e^a =$ _____

$\ln(ab) =$ _____

$\ln\left(\frac{a}{b}\right) =$ _____

$\ln(a^b) =$ _____

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VII. Simplifying Rational Exponents

60. $(512)^{2/3}$

61. $k^{-1/2} = 4$ and $j^{-3} = 8$, then $\frac{k}{j} =$

62. $(-125)^{1/3} - 32^{2/5}$

63. If "a" is a positive integer such that $a^{3/4} = c$, then $\sqrt{a} = ?$

64. Solve for x: $(x+2)^{2/3} = 9$ (hint- there are 2 solutions)

VIII. True – False. If false, describe and correct the error.

65. $9x^{-3} = \frac{1}{9x^3}$

66. $\frac{x^2 + 3x}{-6} = \frac{-x^2}{6} - \frac{x}{2}$

67. $5\left(\frac{x^2}{6}\right) = \frac{5x^2}{30}$

68. $\frac{2x^2 + 3y}{3y} = 2x^2 + 1$

69. $\sqrt{x+y} = \sqrt{x} + \sqrt{y}$

70. $\sqrt{x^2 + 9} = x + 3$

71. $\sqrt{x^2 - 8x + 16} = x - 4$

72. $e^{t+s} = (e^t)^s$

73. $\frac{1}{x+y^{-1}} = \frac{y}{x+1}$

IX. Insert the required factor in the parentheses.

74. $\frac{3x+2}{5} = \frac{1}{5}(\quad)$

75. $\frac{5}{2}x^2 - \frac{1}{4}x + 2 = (\quad)(10x^2 - x + 8)$

76. $3(2x+1)^4 + 4(2x+1)^3 = (2x+1)^3(\quad)$

77. $x^{1/3} - 5x^{4/3} = x^{1/3}(\quad)$