Robbinsville High School
Mathematics Department
155 Robbinsville-Edinburg Road
Robbinsville NJ 08691

Dear Students,

Welcome to Calculus! Attached you will find a summer packet for math reinforcement for the upcoming 2020-2021 school year. This packet should be completed and returned to school on the ***first full day of school***. September is filled with review, but with completion of this packet, the review will come very naturally. The packet will be ***collected*** and ***graded*** as **a 20-point *homework grade*** based on ***completion*** and ***effort***.

To assist in your review and completion of this packet there are videos corresponding to each section of this packet. The videos are linked into this packet using QR codes that look like this: 

In order to view the videos, simply download a QR scanner to your phone, use the scanner to scan the code, and that will directly link you to each video. To see the full collection of videos on your computer, go to: www.vimeo.com/MangieriMath

If you find yourself still confused on certain topics, it is suggested that you search for the topic on one of the following websites:

- ShowMe http://www.showme.com
- Khan Academy: http://www.khanacademy.org/Math
- Math TV: http://www.mathtv.com

We look forward to teaching you and getting to know you next year.

Have a great summer!

Robbinsville High School Mathematics Department

Calculus Name:_____

Summer Packet Date:_____Period:_____

Directions: Using the appropriate inverse operations, solve each equation. Be sure to check for extraneous solutions if applicable.

1. $\sqrt{4a+17} = a-1$

2. $\sqrt{3x-3}+2 = \sqrt{2x+2}$

3. $\sqrt{2m+21} = m+3$

4. $-5 = -r+\sqrt{4r-24}$

5. $-x+\sqrt{39-5x} = -9$

6. $\sqrt{5n-4}-4 = \sqrt{4-n}$

7. $\frac{41}{5} = 8+(14-v)^{\frac{-1}{2}}$

8. $-46 = -1-5(x+1)^{\frac{2}{3}}$

9. $8+2(2x-4)^{\frac{2}{3}} = 440$

10. $864 = 4(2a+6)^{\frac{3}{2}}$

11. $\frac{7x+3}{x^2-8x+15}+\frac{3x}{x-5} = \frac{1}{3-x}$

12. $\frac{4(x-4)}{x^2-+2x-8} = \frac{4}{x+4}$

13. $\frac{1}{2x}+\frac{3}{x+7} = \frac{-1}{x}$

14. $\frac{9}{3x} = \frac{4}{x+2}$

15. $\frac{1}{3}(10^{2x}) = 12$

16. $25e^{2x+1} = 962$

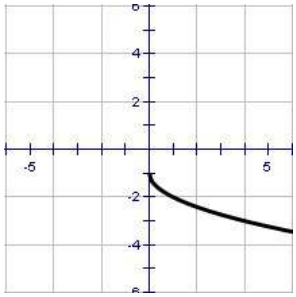
17. $3(12^{x-1})-7 = 2$

18. $1000e^{-4x} = 75$

19. $\log_2(\frac{x+5}{x-2}) = 3$

20. $6\ln(x+1) = 2$

Directions: Identify the Parent Function, the intervals where the function is Increasing and Decreasing and the Domain and Range of the given function.

21. 

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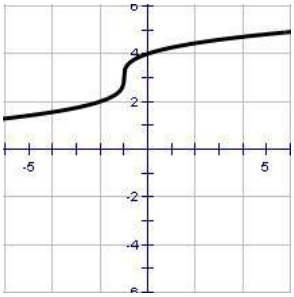
22. 

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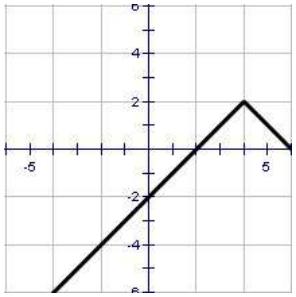
23. 

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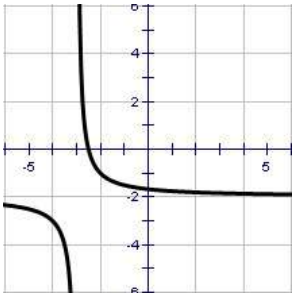
24. 

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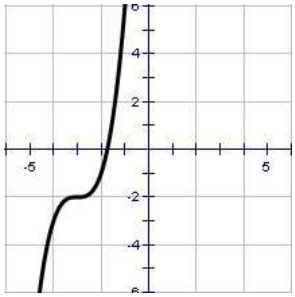
25. 

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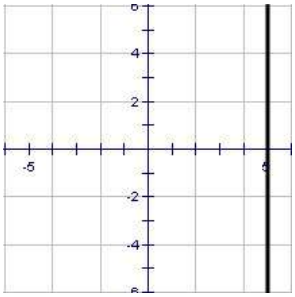
26. 

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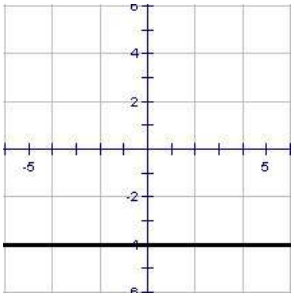
27. 

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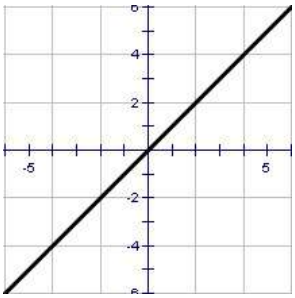
28. 

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Decreasing:_____
Domain:_____
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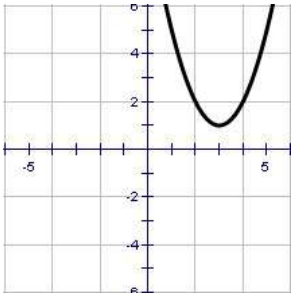
29. 

Name:_____
Increasing:_____
Decreasing:_____
Domain:_____
Range:_____

Directions: Evaluate the function at each specified value of the independent variable and simplify.

30. $g(t) = 4t^2 - 3t + 5$

g(2)= g(t-2)= g(t)- 4g(2)=

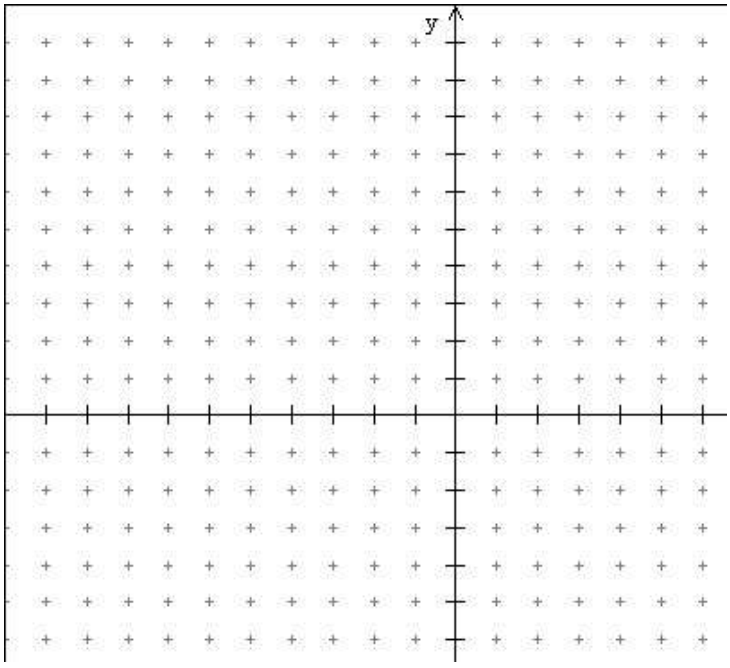
31. $f(x) = \begin{cases} 3x - 1, & x \leq -1 \\ 4x, & -1 < x < 1 \\ x^2 + 1, & x \geq 1 \end{cases}$

f(-2) = f(-1/2) = f(3) =

Directions: Graph the following piecewise functions and define the requested properties.

32. Piecewise equations: Restrictions:

$$F(x) = \begin{cases} 3x - 2 & x \leq 2 \\ x^2 + 1 & -2 < x < 1 \\ 6 & x \geq 1 \end{cases}$$



Domain: _____

Range: _____

Increasing:_____

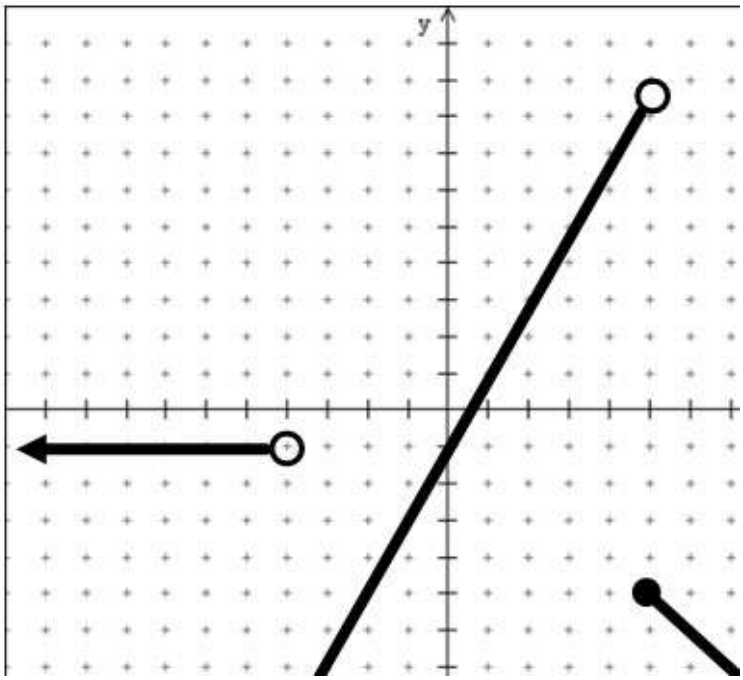
Decreasing: _____

Constant:_____

Directions: Given the graph determine the corresponding piecewise functions and define the requested properties.

33. Piecewise equations: Restrictions:

$F(x) = \begin{cases} \\ \\ \\ \end{cases}$



Domain: _____

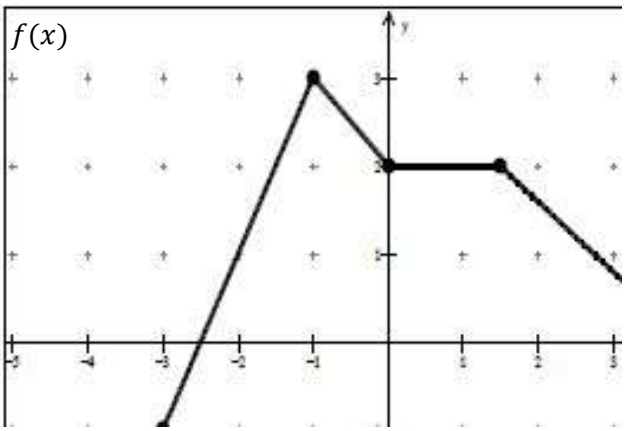
Range: _____

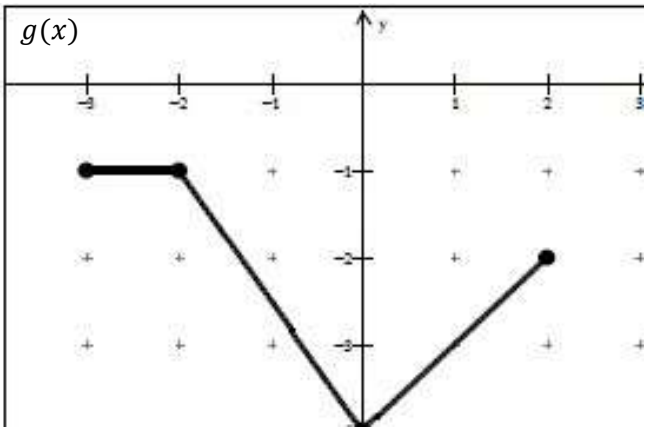
Increasing:_____

Decreasing: _____

Constant:_____

Directions: Use the following graphs to evaluate each specified value.





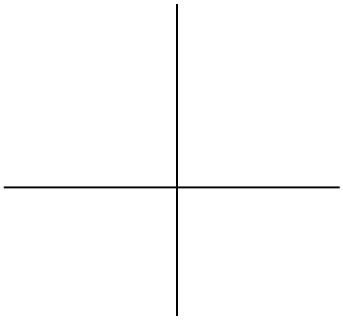
34. a) $(f \circ g)(-3) =$ b) $(g \circ f)(0) =$

35. a) $2g(-3) - 4f(1) =$ b) $\frac{f(2)}{g(1)} =$

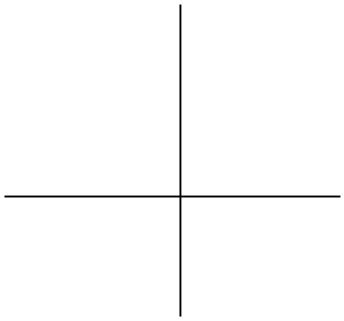
36. a) $(f \circ f)(-1) =$ b) $(g \circ f \circ g)(2) =$

Directions: Sketch the graphs of the following without your calculator.

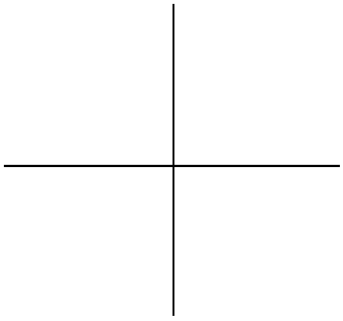
37. $y = -\sqrt{x+2}$



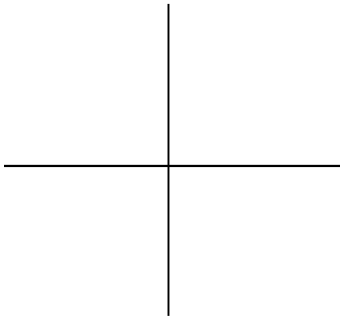
38. $y = x^2 - 4$



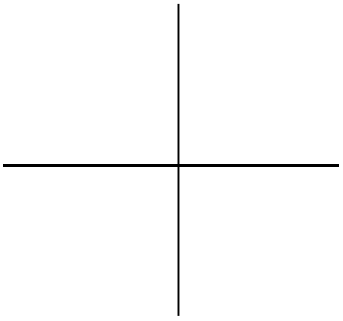
39. $y = \sqrt{x-3}+2$



40. $y = |x+1|-2$

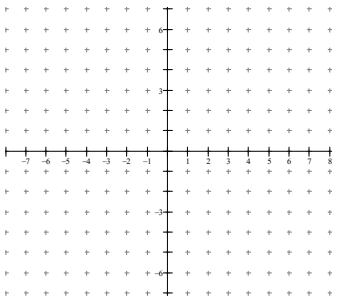


41. $y = \sqrt[3]{x-2}$

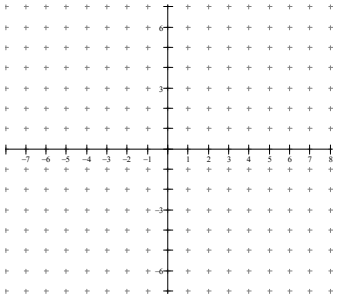


Directions: Determine the parent function, describe its transformations, and sketch:

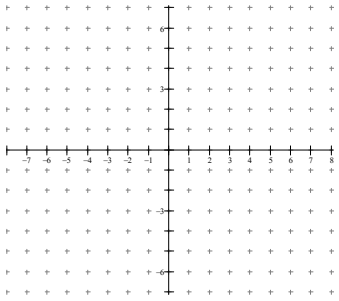
42. $f(x) = -(x+10)^2 + 5$



43. $f(x)=\frac{1}{2}\sqrt{3-x}+2$



44. $f(x)=6-|x+5|$



Directions: Find the distance between the points.

45. (-3, 8), (1, 5)

46. (-2, 6), (4, -3)

47. (5.6, 0), (0, 8.2)

Directions: Find the line that passes through the given point with the given slope. Then find it's perpendicular line through that same point.

48. Point: (3, 0) Slope: $m = \frac{2}{3}$

49. Point: (10, -3) Slope: $m = -\frac{1}{2}$

50. Point: (-3,1) Slope: $m = 0$

Directions: Identify any x and y intercepts of each function.

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

x-int_____

y-int_____

52. $f(x) = 4x^2 - 2$

x-int_____

y-int_____

53. $f(x) = |x| + 4$

x-int_____

y-int_____

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

x-int_____

y-int_____

55. $f(x) = 2x^3 + 1$

x-int_____

y-int_____

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

x-int_____

y-int_____

57. $f(x) = \frac{1}{x^2} + 3$

x-int_____

y-int_____

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

x-int_____

y-int_____

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

x-int_____

y-int_____

60. $f(x) = sinx$

x-int_____

y-int_____

61. $f(x) = 2cosx + 1$

x-int_____

y-int_____

62. $f(x) = tanx$

x-int_____

y-int_____

Directions: Find the inverse function of *f* analytically.

63. $f(x) = \frac{4x+7}{2}$

64. $g(x) = \sqrt{x+7} - 5$

65. $h(x) = \frac{1}{8}(x+2)^2 - 1$

Directions: Identify holes, vertical asymptotes, horizontal asymptotes, or slant asymptotes. Also identify any x-intercepts and y-intercepts.

66. $f(x) = -\frac{4}{x^2-3x}$

Holes: _____

Vertical Asymptote(s): _____

Horizontal Asymptote(s): _____

Slant Asymptote(s): _____

x-intercept(s): _____

y-intercept(s): _____

67. $f(x) = \frac{x-4}{-4x-1}$

Holes: _____

Vertical Asymptote(s): _____

Horizontal Asymptote(s): _____

Slant Asymptote(s): _____

x-intercept(s): _____

y-intercept(s): _____

68. $f(x) = \frac{x^3-9x}{3x^2-6x-9}$

Holes: _____

Vertical Asymptote(s): _____

Horizontal Asymptote(s): _____

Slant Asymptote(s): _____

x-intercept(s): _____

y-intercept(s): _____

69. $f(x) = \frac{3x^2-12x}{x^2-2x-3}$

Holes: _____

Vertical Asymptote(s): _____

Horizontal Asymptote(s): _____

Slant Asymptote(s): _____

x-intercept(s): _____

y-intercept(s): _____

70. $f(x) = \frac{x^2+5x+6}{x^2-9}$

Holes: _____

Vertical Asymptote(s): _____

Horizontal Asymptote(s): _____

Slant Asymptote(s): _____

x-intercept(s): _____

y-intercept(s): _____