

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

## NON-CALCULATOR SECTION

Vocabulary: Define each word and give an example.

1. inverse function
2. domain
3. composite function

Short Answer:

4. What type of symmetry does an even function have? Explain why.
5. Explain how to apply the horizontal line test. What can you conclude if a function passes the test?
6. Describe the domain and range of the sine function.
7. How does the constant  $c$  affect the graph of  $f(x)$  in the function  $f(x+c)$ ?

Review:

8. Solve the equation by completing the square.  $x^2 + 14x + 47 = 0$
9. Solve the equation. Write your solution in interval notation.  $-1 < \frac{3-5x}{2} \leq 7$

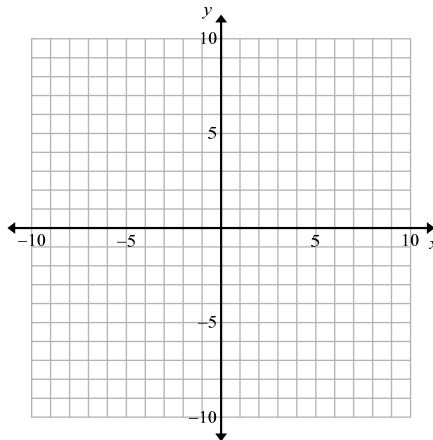
Problems:

\*\*Be sure to show all work used to obtain your answer. Circle or box in the final answer.\*\*

10. Find the domain of the function  $f(x) = \frac{\sqrt{x+5}}{x+2}$ . Express your answer in interval notation.

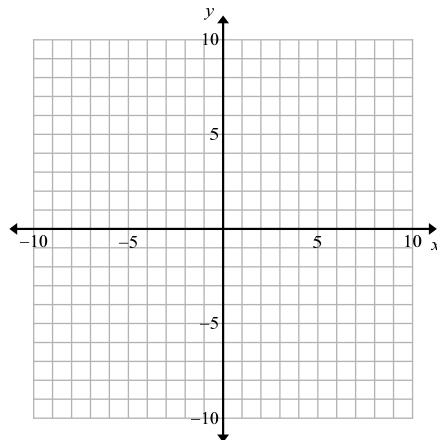
11. Determine an algebraic and graphical model for the table of values.

$x$	-4	-2	0	2	4
$y$	3	2	1	0	-1



12. Find all the asymptotes (vertical and horizontal) for the function  $f(x) = \frac{2x}{x-3}$ .

13. Graph the function  $y = x^3 - 1$  and state the interval on which it is increasing.

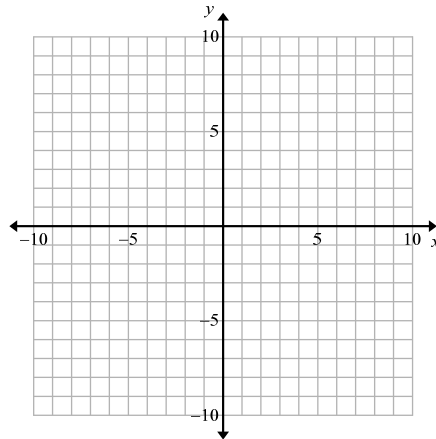


14. Which of the following describes the function  $f(x) = x^2 - |2x|$ ?
- A. odd                      B. even                      C. both odd and even                      D. neither odd nor even

15. Find  $f(x)$  and  $g(x)$  so that the function  $y = \sqrt{(x+1)^3 - 1}$  can be described as  $(f \circ g)(x)$ . Do not use  $f(x) = x$  or  $g(x) = x$ .

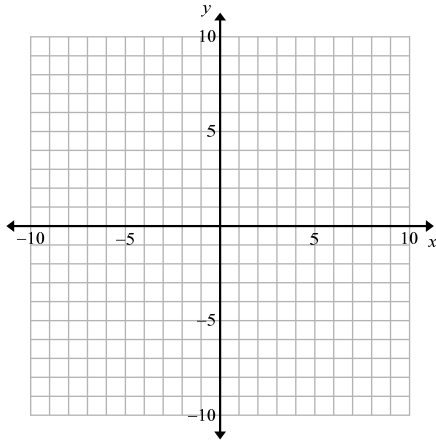
16. Rewrite the parametric equations  $x = 3t - 1$  and  $y = 5t^2$  as one function in terms of  $x$  and  $y$ .

17. Describe the sequence of transformations used to graph the function  $y = \sqrt{2x+8} - 4$ . Then graph the function.



18. Let  $f(x) = \sqrt{x-4}$ . Find  $f^{-1}(x)$  and state its domain.

19. Graph the piecewise function:  $f(x) = \begin{cases} x^2 + 1 & x \leq 1 \\ 3x & x > 1 \end{cases}$



20. Let  $f(x) = (x-2)^2$  and  $g(x) = x^2 - 3$ . Perform the indicated operations and state the domain.

a)  $(f + g)(x)$

b)  $(f - g)(x)$

c)  $(fg)(x)$

d)  $\left(\frac{f}{g}\right)(x)$

e)  $f(g(x))$

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## CALCULATOR SECTION

21. Write an equation for the problem and solve: How much 15% solution and how much 45% solution should be combined to make 30 liters of 35% solution?

22. The amount of household assets in mutual funds for 1995-1999 is shown in the table in billions of dollars.

Year	1995	1996	1997	1998	1999
Household Assets	1265	1586	2057	2501	3104

Find the equation of the linear regression line. Then use it to predict the amount of household assets in mutual funds in 2001.

23. If  $f(x) = \frac{1}{x}$  and  $g(x) = x^2 + 1$ , then  $f(g(-5)) = ?$

24. If  $f(3) = 7$  and  $g$  is the inverse of  $f$ , then  $g(7) = ?$

25. Solve graphically:  $\sqrt{x+5} = 4 - x^2$

26. Write an equation for the problem and solve: One positive number is three times another positive number. The sum of the two numbers is 36. Find the two numbers.