

**Pre-Calculus Review Quiz #4**

Chapter: 3-1, 3-2, 3-3

Name \_\_\_\_\_ Pd \_\_\_\_\_

**Topic 1: symmetry**

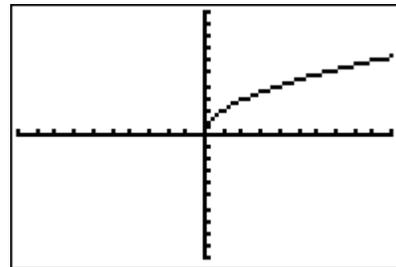
In each of the functions below, determine whether the graph is symmetric with respect to the origin, the x-axis, the y-axis, or the line  $y=x$  and  $y = -x$ .

1.  $f(x) = \frac{1}{x^2}$                       2.  $f(x) = \frac{-2}{x}$                       3.  $f(x) = x^4 - x^2$

4. If  $g(x)$  is an even function and  $g(2) = 4$ , then what will  $g(-2)$  equal?

5. If  $g(x)$  is an odd function and  $g(a-1) = -3$ , then what will  $g(1-a)$  equal?

6. The graph of  $h(x)$  is shown at the right for  $y > 0$ . Complete the graph of  $h(x)$  for  $y < 0$  if  $h(x)$  is symmetric about the x-axis.



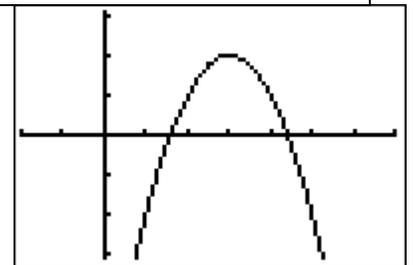
**Topic 2: family of functions**

7. sketch each function (from memory)

$y = x$	$y = x^2$	$y = x^3$
$f(x) = \sqrt{x}$	$x^2 + y^2 = r^2$	$f(x) = \frac{1}{x}$

Consider the function  $h(x) = a(x - b)^2 + c$  where  $a$ ,  $b$ , and  $c$  are constants.

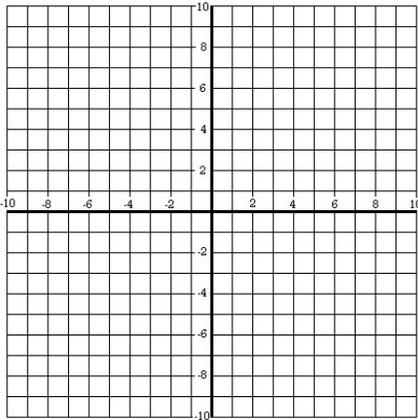
8. Which constant would flip the graph upside down?
9. Which constant would move the graph up?
10. Which constant would move the graph to the left?
11. Define the values of  $a$ ,  $b$ , and  $c$  that create the graph to the right →



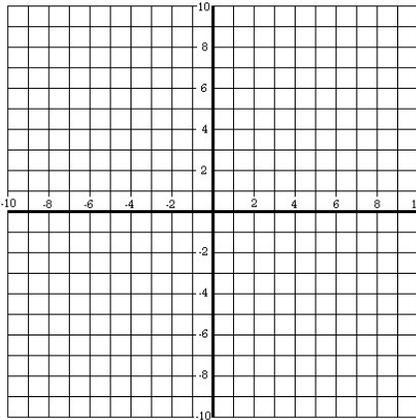
### Topic 3: graphing inequalities

Graph the following inequalities, and state if the ordered pair is a solution for the inequality.

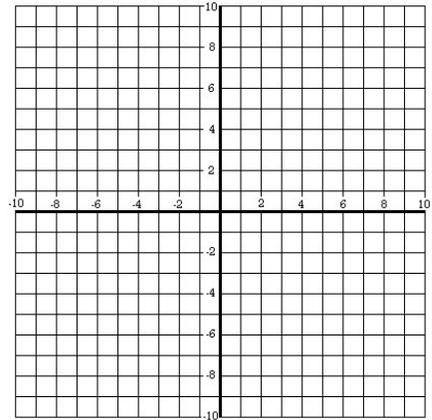
$$y \leq -x^3 + 2x - 1 \quad (0, 0)$$



$$13. \quad y > |x - 2| + 1 \quad (3, -1)$$



$$14. \quad x^2 + y^2 \leq 9 \quad (0, 7)$$



### ACT/SAT Questions

$$15. \quad \begin{aligned} 5x - 10y &= 2z \\ x &= 3 \end{aligned}$$

If  $x$ ,  $y$ , and  $z$  satisfy the equations above and if  $5y = 30$ , find the value of  $z$

16. What is 25% of  $(80x + 20)$

17. Let the function  $f$  be defined by  $f(x) = x^3 - 4$ . Which of the following has a positive value?

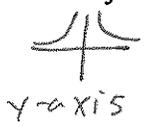
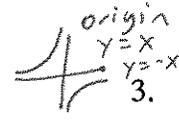
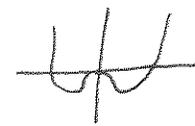
- A.  $f(-2)$       B.  $f(-1)$       C.  $f(0)$       D.  $f(1)$       E.  $f(2)$

18. What is an equation of the line parallel to the  $x$ -axis and 4 units below the  $x$ -axis in the  $xy$ -plane?

- A.  $y = 4$       B.  $y = -4$       C.  $x = 4$       D.  $x = -4$       E.  $y = 4x - 4$

**Topic 1: symmetry**

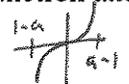
In each of the functions below, determine whether the graph is symmetric with respect to the origin, the x-axis, the y-axis, or the line  $y=x$  and  $y = -x$ .

1.  $f(x) = \frac{1}{x^2}$   2.  $f(x) = \frac{-2}{x}$   3.  $f(x) = x^4 - x^2$  

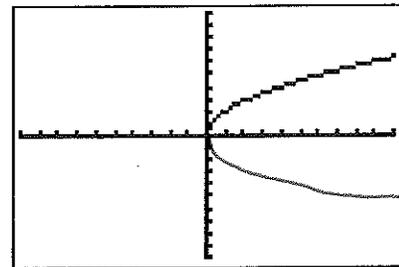
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 4

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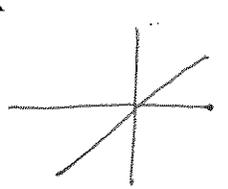
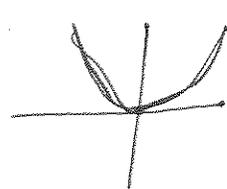
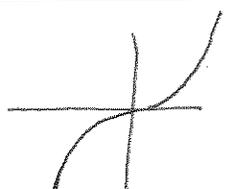
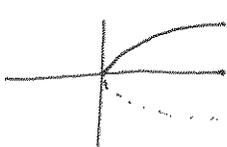
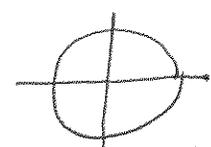
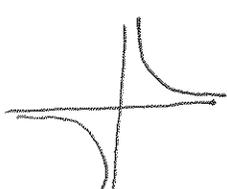
  $(-1)(a-1) = 1-a$  3

6. The graph of  $h(x)$  is shown at the right for  $y > 0$ . Complete the graph of  $h(x)$  for  $y < 0$  if  $h(x)$  is symmetric about the x-axis.



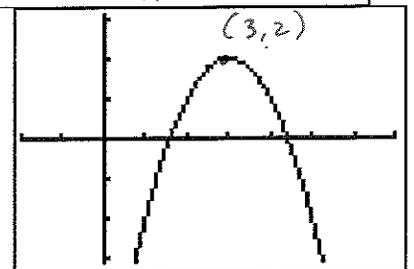
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Consider the function  $h(x) = a(x - b)^2 + c$  where  $a$ ,  $b$ , and  $c$  are constants.

- Which constant would flip the graph upside down?  $a$
- Which constant would move the graph up?  $c$
- Which constant would move the graph to the left?  $b$
- Define the values of  $a$ ,  $b$ , and  $c$  that create the graph to the right  $\rightarrow$



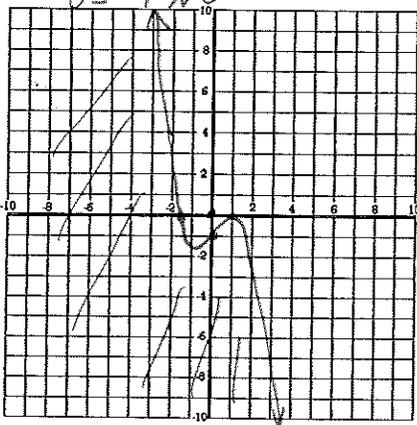
Notebook Check:

$a = -1$   $b = +3$   $c = 2$

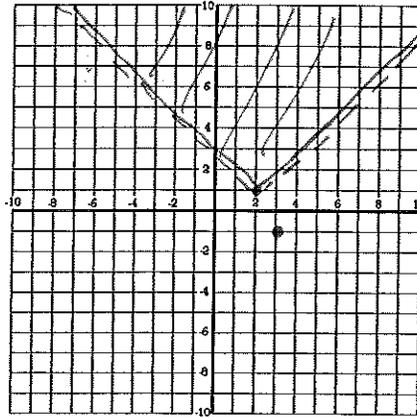
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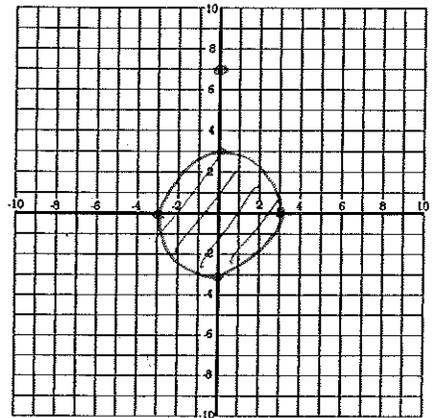
$y \leq -x^3 + 2x - 1$  (0, 0)



13.  $y > |x - 2| + 1$  (3, -1)



14.  $x^2 + y^2 \leq 9$  (0, 7)



$3 > 3 + 1$   $3 > 4$   
 $3 > |-1 - 2| + 1$   
 NO

$0^2 + 7^2 \leq 9$   
 NO

$y \leq \sqrt{9 - x^2}$   
 $y \geq -\sqrt{9 - x^2}$

**ACT/SAT Questions**

15.  $5x - 10y = 2z$   
 $x = 3$

If  $x$ ,  $y$ , and  $z$  satisfy the equations above and if  $5y = 30$ , find the value of  $z$

$y = 6$

$5(3) - 10(6) = 2z$   
 $15 - 60 = 2z$   
 $-45 = 2z$   
 $-22.5 = z$

16. What is 25% of  $(80x + 20)$   $20x + 5$

17. Let the function  $f$  be defined by  $f(x) = x^3 - 4$ . Which of the following has a positive value?

- A.  $f(-2)$     B.  $f(-1)$     C.  $f(0)$     D.  $f(1)$     **E.  $f(2)$**

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