Name: Key

Pre-Calculus

Review Section 1.1 part 3 and 4

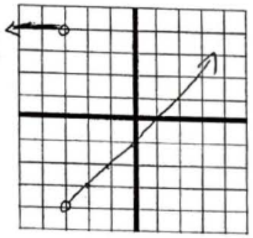
Part I. Carefully graph each of the following, then evaluate

1. $h(x) = \begin{cases} 4, & x < -3 \\ x - 1, & x > -3 \end{cases}$

$h(2) =$ 1

$h(-4) =$ 4

$h(-3) =$ und

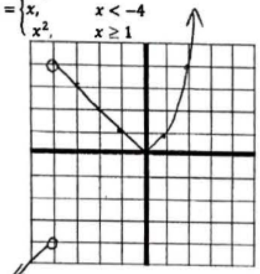


3. $g(x) = \begin{cases} |x|, & -4 < x < 1 \\ x, & x < -4 \\ x^2, & x \geq 1 \end{cases}$

$g(1)$

$g(-3)$

$g(-6)$

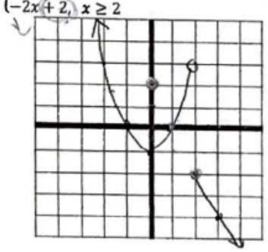


2. $m(x) = \begin{cases} x^2 - 1, & x < 2 \\ -2x + 2, & x \geq 2 \end{cases}$

$m(2) =$

$m(-1) =$

$m(6) =$

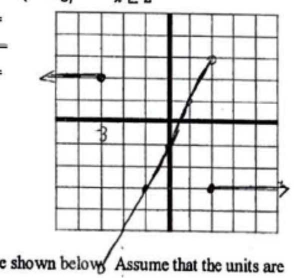


4. $p(x) = \begin{cases} 2, & x \leq -3 \\ 2x - 1, & -3 < x < 2 \\ -3, & x \geq 2 \end{cases}$

$p(0) =$

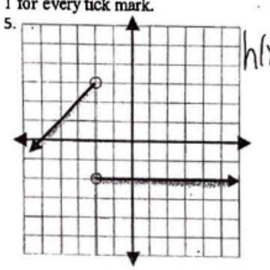
$p(-3) =$

$p(2) =$

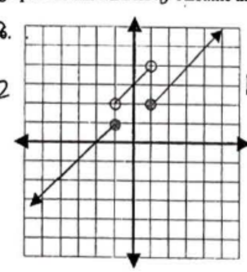


Part II. Write equations for the piecewise functions whose graphs are shown below. Assume that the units are 1 for every tick mark.

5.



$h(x) = \begin{cases} x+5, & x < -2 \\ -2, & x \geq 2 \end{cases}$



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

7. How do you graph a piecewise function? To graph a piecewise function, you need to creat a table of values for each function that includes the value of the interval and other x values that fall in the interval to finally plot the points

Part III: Write the set notation for the domain of each function.

8. $f(x) = x + 5$ $\{x \in \mathbb{R}\}$

9. $f(x) = \frac{1}{x+5}$ $\{x \in \mathbb{R} \mid x \neq -5\}$

10. $f(x) = \sqrt{x+5}$ $\{x \in \mathbb{R} \mid x \geq -5\}$

11. $f(x) = \frac{1}{\sqrt{x+5}}$ $\{x \in \mathbb{R} \mid x > -5\}$

12. $f(x) = \frac{\sqrt{x-5}}{x}$ $\{x \in \mathbb{R} \mid x \geq 5\}$

13. What do you exclude from the domain in functions?

The x values that are excluded from the domain are #s that make the denominator zero and the radicand negative.

14. How is the domain of $f(x) = \sqrt{x}$ and $g(x) = \frac{1}{\sqrt{x}}$ different? Why?

for $f(x)$ we can include $x = 0$ but for $g(x)$ we can't.

15. How is the domain of $f(x) = \sqrt{x}$ and $g(x) = \sqrt[3]{x}$ different? Why

the doman of $f(x)$ can't have negative number but $g(x)$ can have negative numbrs.

Domain of $f(x)$ $\{x \in \mathbb{R} \mid x \geq 0\}$

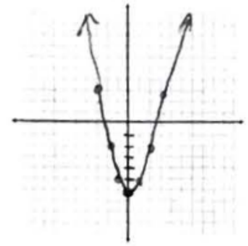
Domain of $g(x)$ $\{x \in \mathbb{R}\}$

For problem 1- 6, please give the name of the parent function and describe the transformation represented. You may use your graphing calculator to compare & sketch.

1. $g(x) = x^2 - 6$

Parent: Quadratic

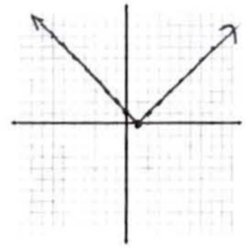
Transformations: Shifted down 6 units



2. $f(x) = |x - 1|$

Parent: absolute value

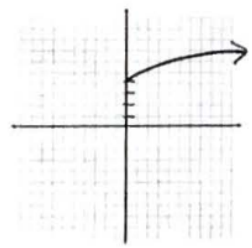
Transformations: Shifted right 1 unit



3. $h(x) = \sqrt{x} + 4$

Parent: Square root

Transformations: Shifted up 4 units

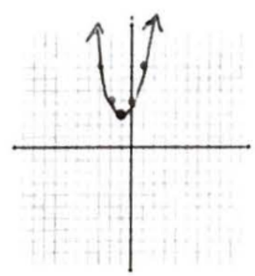


4. $g(x) = (x+1)^2 + 3$

$v(-1, 3)$

Parent: Quadratic

Transformations: Shifted 1 unite left and 3 units up



For problems 10 – 14, given the parent function and a description of the transformation, write the equation of the transformed function, f(x).

10. Absolute value—vertical shift down 5, horizontal shift right 3. -5 -3 $f(x) = |x-3| - 5$

11. Linear—vertical shift up 5. $f(x) = x + 5$

12. Square Root —vertical shift down 2, horizontal shift left 7. -2 $+7$ $f(x) = \sqrt{x+7} - 2$

13. Quadratic— horizontal shift left 8. $+8$ $f(x) = (x+8)^2$

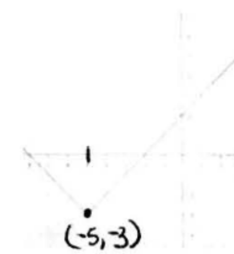
14. Quadratic—vertex at (-5, -2). $f(x) = (x+5)^2 - 2$

Write the equation for the following translations of their particular parent graphs. You may use y= or function notation (the f(x) type notation).

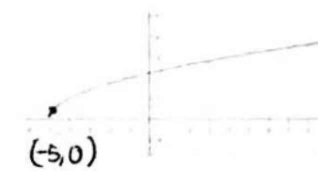
17. $f(x) = x^2 - 5$

$V(0, -5)$

18. $f(x) = |x+5| - 3$



19. $f(x) = \sqrt{x+5}$



Pre Calculus

Name <u>Key</u>

Review Section 1.4 Combination of Funcitons

Perform the indicated operation.

1) $h(x) = x + 4$
$g(x) = 2x + 5$
Find $(h - g)(x)$

$h(x) - g(x)$
$x + 4 - (2x + 5)$
$x + 4 - 2x - 5$
$= \boxed{-x - 1}$

2) $h(x) = x^3 - x^2 + 2x$
$g(x) = 3x + 5$
Find $(h + g)(x)$ $= h(x) + g(x)$
$= x^3 - x^2 + \underbrace{2x + 3x}_{} + 5$
$\boxed{= x^3 - x^2 + 5x + 5}$

3) $h(x) = -2x + 4$
$g(x) = x^2 + 2$
Find $h(x) \div g(x)$ $= \dfrac{h(x)}{g(x)}$
$\boxed{= \dfrac{-2x + 4}{x^2 + 2}}$

4) $g(x) = x^2 - 3x$
$f(x) = 4x + 3$
Find $g(x) \cdot f(x)$ $= (x^2 - 3x)(4x + 3)$
$= 4x^3 + \underbrace{3x^2 - 12x^2}_{} - 9x$
$\boxed{= 4x^3 - 9x^2 - 9x}$

5) $g(x) = -4x + 3$
$f(x) = 3x - 4$
Find $(g \circ f)(x)$ $= g(f(x))$
$= g(3x - 4)$
$= -4(3x - 4) + 3$
$= -12x + 16 + 3$
$\boxed{= -12x + 19}$

6) $g(x) = 3x - 1$
Find $g(g(5))$

$g(5) = 3(5) - 1$ ^15
$= 14$

$g(14) = 3(14) - 1$
$= 42 - 1$
$\boxed{= 41}$

7) $h(x) = 2x - 2$
$g(x) = 2x + 1$

8) $f(x) = x + 3$
$g(x) = -2x^3 - 3$

Find $(h \circ g)(1)$ $= h(g(1))$

$g(1) = 2(1)+1$
$= 2+1$
3

$\Rightarrow h(3) = 2(3)-2$
$= 6-2$
$\boxed{= 4}$

Find $f(g(x))$ $= f(-2x^3-3)$
$= -2x^3 - \cancel{3} + \cancel{3}$
$\boxed{= -2x^3}$