

Name Answer key (1)
 Period# _____

Pre-cal: Review 2.1-2.4

Evaluate the function at the indicated values.

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

(a) $f(-1) = 2(-1) + 1$
 $= -2 + 1 = \boxed{-1}$

(b) $f(\frac{1}{2}) = 2(\frac{1}{2}) + 1$
 $= 1 + 1 = \boxed{2}$

(c) $f(\frac{1}{x}) = 2(\frac{1}{x}) + 1 = \boxed{\frac{2}{x} + 1}$

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

(a) $f(-3) = 3(-3)^2 + 2(-3) - 1$
 $= 3(9)$
 $= 27 - 6 - 1 = \boxed{20}$

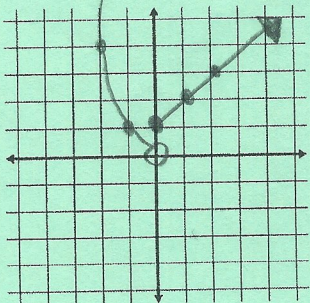
(b) $f(-x)$

$3(-x)^2 + 2(-x) - 1$

$\boxed{3x^2 - 2x - 1}$

3. Evaluate the piecewise defined function at the indicated values.

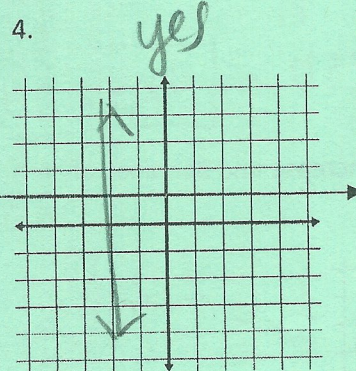
$$f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ x + 1 & \text{if } x \geq 0 \end{cases}$$



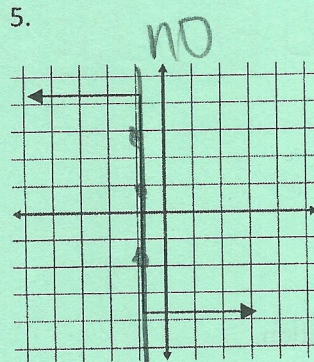
$\frac{x}{y}$ open
 $\frac{0}{0}$
 $\frac{-1}{1}$
 $\frac{-2}{4}$
 closed

$\frac{x}{y}$
 $\frac{0}{1}$
 $\frac{1}{2}$
 $\frac{2}{3}$

Determine whether the graph is a function of x. If it is, state the domain and range of the function.



Domain: $(-\infty, \infty)$
 Range: $\{-1\}$



Domain:
 Range:

6. Find the average rate of change.

$f(x) = x^2 - 3x + 5$; $x = -1, x = 3$

$\frac{f(3) - f(-1)}{3 - (-1)} = \frac{5 - 9}{4} = \frac{-4}{4} = \boxed{-1}$

$f(3) = 3^2 - 3(3) + 5$
 $9 - 9 + 5 = 5$

$f(-1) = (-1)^2 - 3(-1) + 5$
 $= 1 + 3 + 5 = 9$

7. Find the average rate of change.

$f(x) = x^3 - 4x^2$; $x = 0, x = 10$

$\frac{f(10) - f(0)}{10 - 0} = \frac{6000 - 0}{10} = \frac{6000}{10} = \boxed{600}$

$f(10) = 10^3 - 4(10)^2$
 $= 1000 - 400 = 600$

$f(0) = 0$

8. Find the average rate of change.

$f(x) = -x^2 - 3x - 1$; $x = -3, x = 2$

$\frac{f(2) - f(-3)}{2 - (-3)} = \frac{-11 - 1}{5} = \frac{-12}{5} = \boxed{-\frac{12}{5}}$

$f(2) = -(2)^2 - 3(2) - 1$
 $= -4 - 6 - 1 = -11$

$f(-3) = -(-3)^2 - 3(-3) - 1$
 $= -9 + 9 - 1 = -1$

$$f(x+h) = 2(x+h)^2 + 5(x+h) - 4$$

$$= 2(x^2 + 2xh + h^2)$$

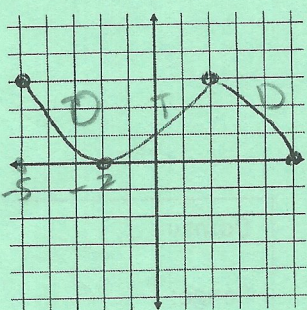
9. Find the average rate of change. $\frac{f(x+h) - f(x)}{h}$
(Difference quotient)

$$f(x) = 2x^2 + 5x - 4; a = x, b = x+h$$

$$= \frac{2x^2 + 4xh + 2h^2 + 5x + 5h - 4 - (2x^2 + 5x - 4)}{h}$$

$$= \frac{4xh + 2h^2 + 5h}{h} = \boxed{4x + 2h + 5}$$

10. Find the interval of increase and decrease of the following graph.



$$I: [-2, 2]$$

$$D: [5, 2], [2, 5]$$

11. Describe the transformation.

$$(a) f(x) = -5(x-2)^2 + 3$$

shift up 3

shift right 2

vertical stretch by 5

reflect x-axis

12. Write the transformation.

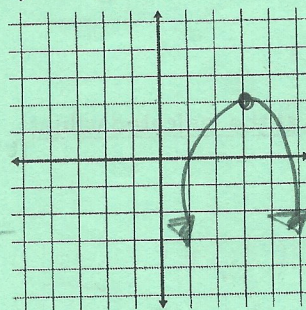
$$\text{Given: } f(x) = x^2$$

Left 5, down 6, vertical stretch by 3 and reflect the x-axis.

$$g(x) = -3(x+5)^2 - 6$$

13. Graph each transformation.

$$(a) y = -(x-3)^2 + 2$$



up 2
right 3
reflect
x-axis
 $x^2 \rightarrow$

14. Find the domain. Write as an interval.

$$f(x) = \frac{1}{x+7} \geq 0$$

$$\boxed{x \neq -7}$$

$$15. f(x) = \sqrt{2x-7} \geq 0^2$$

$$2x - 7 \geq 0$$

$$\frac{2x}{2} \geq \frac{7}{2}$$

$$\boxed{x \geq \frac{7}{2}}$$