

1. Determine the domain and range for each function.

a)  $g(x) = \sqrt{x-1}$

d:  $x \geq 1$

r:  $y \geq 0$

b)  $h(x) = |x+4|$

d: all real numbers

r:  $y \geq 0$

c)  $f(x) = \sqrt{x} + 2$

d:  $x \geq 0$

r:  $y \geq 2$

d)  $p(x) = |x| - 5$

d: all real numbers

r:  $y \geq -5$

e)  $m(x) = -\sqrt{x} - 8$

d:  $x \geq 0$

r:  $y \leq -8$

f)  $n(x) = -|x| + 6$

d: all real numbers

r:  $y \leq 6$

2. State the domain and range.  $\{(7,3), (-8,2), (9,0), (5,17)\}$

d:  $\{7, -8, 9, 5\}$

r:  $\{3, 2, 0, 17\}$

3. Given the relation:  $\{(4,-2), (6,-2), (-4,1), (6,5)\}$ , determine if this is a function or not. Justify your answer.

No, this is NOT a function because each input doesn't have it's own output.

(The input 6, has 2 outputs of -2 and 5)

4. Find the solution to each system of equations.

a)  $\begin{cases} 3x + 2y = 13 \\ 6x - 3y = 33 \end{cases} \rightarrow \begin{cases} -6x - 4y = -26 \\ 6x - 3y = 33 \end{cases}$

$3x + 2y = 13$

$3x + 2(-1) = 13$

$3x - 2 = 13$

$+2 \quad +2$

$3x = 15$

$x = 5$

$7y = 7$

$-7 \quad -7$

$y = -1$

b)  $\begin{cases} 4x - 5y = -28 \\ 3x + 2y = 2 \end{cases} \rightarrow \begin{cases} 8x - 10y = -56 \\ 15x + 10y = 10 \end{cases}$

$23x = -46$

$23x = -46$

$23 \quad 23$

$x = -2$

$3x + 2y = 2$

$3(-2) + 2y = 2$

$-6 + 2y = 2$

$+6 \quad +6$

$2y = 8$

$y = 4$

5. Sarah only has dimes,  $d$ , and quarters,  $q$ , in her piggy bank. There is a total of \$12.50 and 140 coins in the piggy bank. Write a system of equations that could be used to determine how many of each type coin she has in the piggy bank.

$d + q = 140$

$.10d + .25q = 12.50$

6. Daniel bought a boat for \$48,000. The boat depreciates in value by 3.6% each year. How much will the boat be worth to the nearest cent in 9 years?

0.036  
↓

$$y = a(1-r)^t$$

$$y = 48000(1-0.036)^9$$

$$y = 48000(0.964)^9$$

$$\boxed{y = \$34509.17}$$

7. In the function  $g(x) = 960(1.08)^t$ , explain what 960 and 1.08 represent.

960  $\Rightarrow$  y-intercept  
1.08  $\Rightarrow$  growth factor

8. In the function  $h(x) = 2,400(0.77)^t$ , explain what 2,400 and 0.77 represent.

2400  $\Rightarrow$  y-intercept  
0.77  $\Rightarrow$  decay factor

9. Given  $f(x) = 20(25)^t$  and  $g(x) = 20(5)^{2t}$ , determine if the two functions are equivalent. Justify your answer.

$$f(x) = 20(\underline{25})^t$$

$$f(x) = 20(\underline{5^2})^t$$

$$f(x) = 20(\underline{5})^{2t}$$

$$g(x) = 20(5)^{2t}$$

yes, equivalent

10. Evaluate  $f(x) = 64(\frac{1}{2})^x$  for  $f(4)$ .

$$f(4) = 64(\frac{1}{2})^4$$

$$f(4) = 64(\frac{1}{16})$$

$$\boxed{f(4) = 4}$$

11. Solve algebraically.

a)  $5(x-6) \geq -20$

$$5x - 30 \geq -20$$

$$\begin{array}{r} 5x - 30 \geq -20 \\ +30 \quad +30 \\ \hline 5x \geq 10 \end{array}$$

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

b)  $-2(x+4) > 14$

$$-2x - 8 > 14$$

$$\begin{array}{r} -2x - 8 > 14 \\ +8 \quad +8 \\ \hline -2x > 22 \\ \hline -2 \quad -2 \\ \hline x < -11 \end{array}$$

$$\boxed{x < -11}$$

c)  $-18 < -3(x+2) + 12$

$$-18 < -3x - 6 + 12$$

$$-18 < -3x + 6$$

$$\begin{array}{r} -18 < -3x + 6 \\ -6 \quad -6 \\ \hline -24 < -3x \end{array}$$

$$\begin{array}{r} -24 < -3x \\ -3 \quad -3 \\ \hline 8 > x \end{array}$$

$$\boxed{x < 8}$$

12. Determine if each is rational or irrational.

a)  $\frac{1}{2} + \sqrt{17}$  irr  
irrational

b)  $\frac{1}{\sqrt{9}} - \frac{2}{3}$   
rational

c)  $\frac{1}{\sqrt{4}} + 0.6$   
rational

13. Find the sum of  $x^2 + 9x - 15$  and  $3x^2 - 9x + 8$ .

$$(x^2 + 9x - 15) + (3x^2 - 9x + 8)$$

$$x^2 + 9x - 15 + 3x^2 - 9x + 8$$

$$\boxed{4x^2 - 7}$$

14. Find the difference of  $2x^2 - 6x + 11$  and  $4x^2 - x - 13$ .

$$(2x^2 - 6x + 11) - (4x^2 - x - 13)$$

$$2x^2 - 6x + 11 - 4x^2 + x + 13$$

$$\boxed{-2x^2 - 5x + 24}$$

15. From  $9x^2 + 5x - 6$ , subtract  $x^2 - 5x - 6$ .

$$(9x^2 + 5x - 6) - (x^2 - 5x - 6)$$

$$9x^2 + 5x - 6 - x^2 + 5x + 6$$

$$\boxed{8x^2 + 10x}$$

16. Subtract  $7x^2 - 10x + 3$  from  $5x^2 + x - 4$ .

$$(5x^2 + x - 4) - (7x^2 - 10x + 3)$$

$$5x^2 + x - 4 - 7x^2 + 10x - 3$$

$$\boxed{-2x^2 + 11x - 7}$$

17. Find the area of a rectangle in terms of  $x$  when the length is represented by  $(3x + 7)$  and the width is represented by  $(2x - 9)$ .

$$A = (3x + 7)(2x - 9)$$

$$A = 3x(2x - 9) + 7(2x - 9)$$

$$A = 6x^2 - 27x + 14x - 63$$

$$\boxed{A = 6x^2 - 13x - 63}$$

18. Solve for  $y$  and determine which function is not equivalent to the others.

a)  $8y - 16 = 4x$

$$\frac{8y - 16 + 16}{8} = \frac{4x + 16}{8}$$

$$y = \frac{1}{2}x + 2$$

b)  $9y - 3x = 18$

$$\frac{9y - 3x + 3x}{9} = \frac{18 + 3x}{9}$$

$$y = \frac{1}{3}x + 3$$

c)  $\frac{7x + 28}{14} = \frac{14y}{14}$

$$\frac{1}{2}x + 2 = y$$

19. Find the average rate of change.

$x$	10	12	14	16	18
$f(x)$	1.2	1.6	2.0	2.4	2.8

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{2.8 - 1.2}{18 - 10} = \frac{1.6}{8} = 0.2$$

$$\boxed{\frac{y_2 - y_1}{x_2 - x_1}}$$

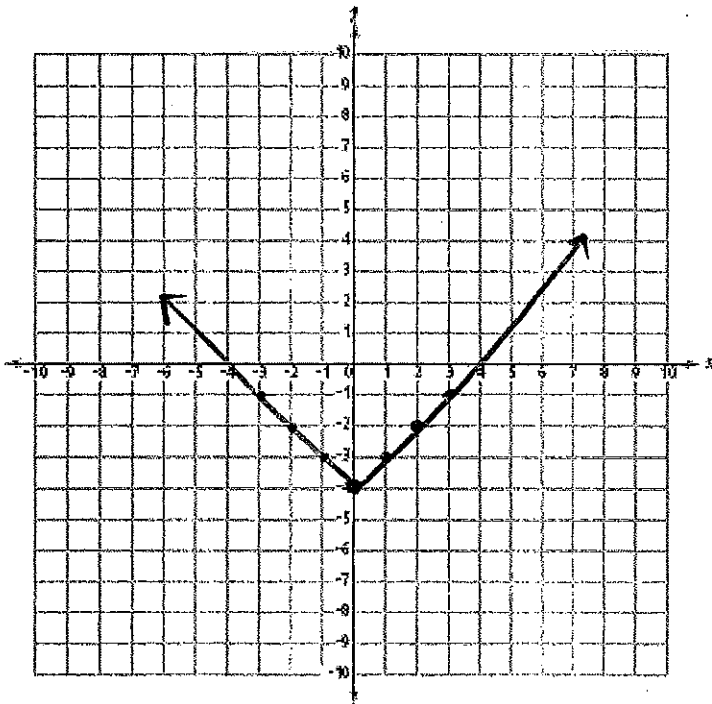
ANSWER

Average rate of change = slope

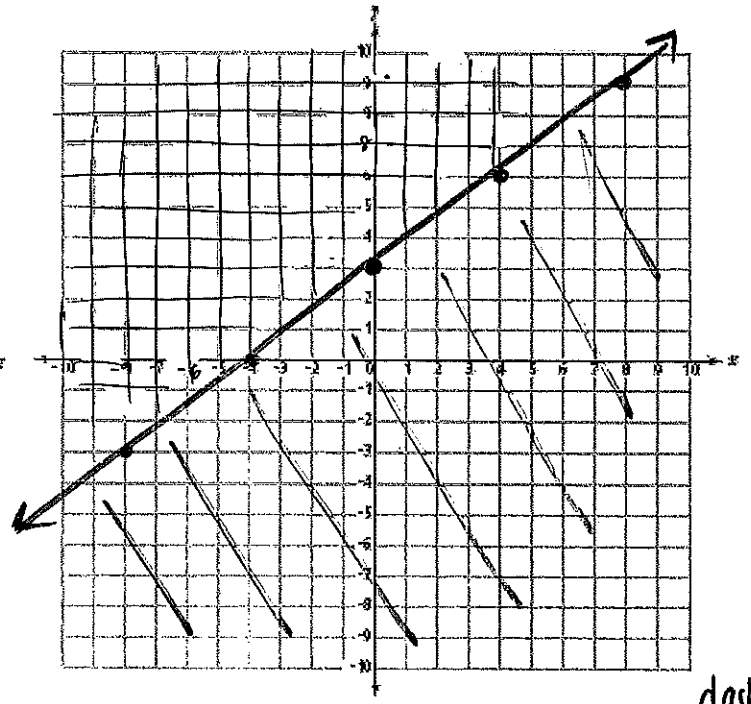
NOT EQUIVALENT TO THE OTHERS

20. Graph each function.

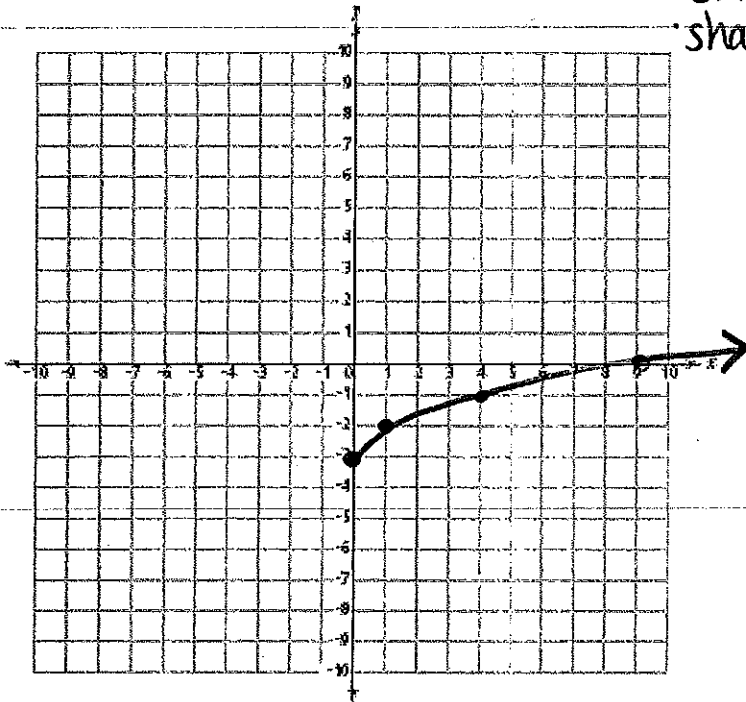
a)  $y = |x| - 4$



b)  $y \leq \frac{3}{4}x + 3$



c)  $y = \sqrt{x} - 3$



d)  $y - 2x > 2$   
 $y \leq -4x - 3$

$y - 2x > 2$   
 $+2x \quad +2x$   
 $y > 2x + 2$   
 State a point in the solution set  $(-10, 10)$

• solid line  
 • shade down

