

1. Write down the appropriate expression for "6 less than the product of 5 and x ". $5x - 6$

2. Simplify $(3x + 4x - 2x) + x - 27$

$$x^2 + 5x - 27$$

3. Evaluate $x^2 - y$ if $x = -6, y = 3$

$$\begin{aligned} (-6)^2 - 3 \\ 36 - 3 = 33 \end{aligned}$$

4. Define the variable then write the equation modeling the situation.

a. "Stacie's test score minus 20 is 75"

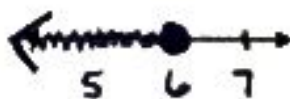
t - test score $t - 20 = 75$

b. "15 less than the number of peppermints plus one is 30"

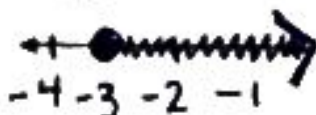
p - peppermints $(p + 1) - 15 = 30$

5. Graph the inequalities:

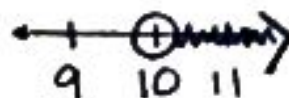
a. $x \leq 6$



b. $-3 \leq x$
 $x \geq -3$



c. $x > 10$



6. Solve:

a. $\frac{5}{7}x + 2 = -3$

$$\frac{5}{7}x = -5 \cdot 7$$

$$\frac{5x}{5} = \frac{-35}{5}$$

$$x = -7$$

b. $20 = 4 - 8x$

$$\frac{16}{-8} = \frac{-8x}{-8}$$

$$-2 = x$$

c. $-3(4x - 2) = 8x - 14$

$$\begin{aligned} -12x + 6 &= 8x - 14 \\ +12x & \quad +12x \end{aligned}$$

$$\begin{aligned} 6 &= 20x - 14 \\ +14 & \quad +14 \end{aligned}$$

$$\frac{20}{20} = \frac{20x}{20}$$

$$1 = x$$

7. A. Solve: $2xy - 4 = z$ for y .

$$\frac{2xy}{2x} = \frac{z + 4}{2x}$$

$$y = \frac{z + 4}{2x}$$

Solve the inequalities and graph!

a. $8x - 2 - 4x \geq 14$

$$\begin{aligned} 4x - 2 &\geq 14 \\ +2 & \quad +2 \end{aligned}$$

$$\frac{4x}{4} \geq \frac{16}{4}$$

$$x \geq 4$$



b. Solve: $P = 2l + 2w$ for w .

$$\frac{P - 2l}{2} = \frac{2w}{2}$$

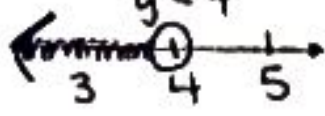
$$\frac{P - 2l}{2} = w$$

b. $5y - 8 < 2y + 4$

$$\begin{aligned} 3y - 8 &< 4 \\ +8 & \quad +8 \end{aligned}$$

$$\frac{3y}{3} < \frac{12}{3}$$

$$y < 4$$

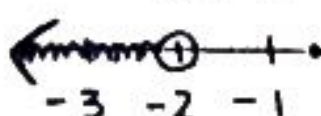


c. $-2(x + 7) > -10$

$$\begin{aligned} -2x - 14 &> -10 \\ +14 & \quad +14 \end{aligned}$$

$$\frac{-2x}{-2} > \frac{4}{-2}$$

$$x < -2$$



9. Justify each step to solving the following equations. Include the name of the property and explain how the property was used

$$2(x + 5) - 3 = 21$$

Properties used?

How was it used?

$$2x + 10 - 3 = 21$$

Distributive Property

Distribute 2

$$2x + 7 = 21$$

Combine Like Terms

10 - 3 on same side

$$2x = 14$$

Subtraction Property

-7 on each side

$$x = 7$$

Division Property

Divide by 2 each side

10. What is the Now-Next AND formal recursive rule for the recursive pattern below? Include start number (a_0).

+12

0, 12, 24, 36, 48,

Next = Now + 12

$$a_n = a_{n-1} + 12$$

Start at $a_0, a_1, a_2, a_3, a_4, a_5$

Start at \bullet -12

$$a_0 = -12$$

11. Given the recursive formula, calculate the 10th term in the sequence

$$a_1 = 0$$

Start = 1, Next = Now * 3

$$a_0 = 1$$

$\frac{-3}{a_1}, \frac{9}{a_2}, \frac{-27}{a_3}, \frac{81}{a_4}, \dots$

$$10^{\text{th}}: 59049$$

12. In the function $f(x) = 2x^2 + 5$ and $h(x) = x - 6$ what is the value of

a. $f(-3)$?

b. $f(2)$

c. $h(-1)$

d. $h(7)$

$$-2(-3)^2 + 5$$

$$-2(2)^2 + 5$$

$$(-1) - 6$$

$$(7) - 6$$

$$-2(9) + 5$$

$$-2(4) + 5$$

$$-7$$

$$1$$

$$-18 + 5$$

$$-8 + 5$$

$$-13$$

$$-3$$

13. If $f(x) = -3x + 8$. Find:

a. Find "x" if $f(x) = -22$

b. Find "x" if $f(x) = 14$

$$-22 = -3x + 8$$

$$14 = -3x + 8$$

$$\frac{-30}{-3} = \frac{-3x}{-3}$$

$$10 = x$$

$$\frac{6}{-3} = \frac{-3x}{-3}$$

$$-2 = x$$

14. What is the Input-Output rule for the following table:

X	Y
1	1
2	4
3	7
4	10
5	13

A. Output = Input + 3

B. Output = Input(2) + 1

C. Output = Input(3) - 2

D. Output = Input(3)

$$5(3) - 2$$

$$15 - 2$$

15. Given the following recursive sequence, find the NEXT-NOW rule and the fifth term

2, -12, 72, ...

NEXT-NOW: Next = Now * -6 Formal: $a_n = a_{n-1} * -6$ $a_1 = 2592$

times -6

$$\underline{-432}, \underline{2592}$$

16. Given the following rules, calculate the first 3 terms:

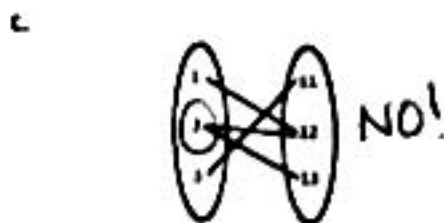
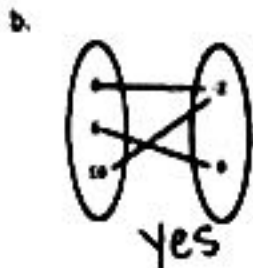
a. NEXT = NOW(3) - 2, start = 5 13, 37, 109 b. $a_n = -2a_{n-1} + 3, a_0 = 4$ -5, 13, -23
 $-2(4) + 3$

17. Decide if each relation is a function.

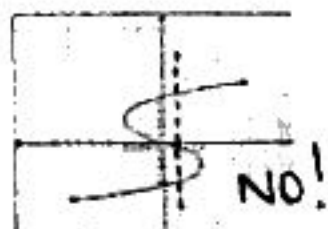
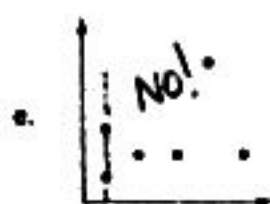
a.

X	Y
1	3
2	9
3	7
4	7
5	13

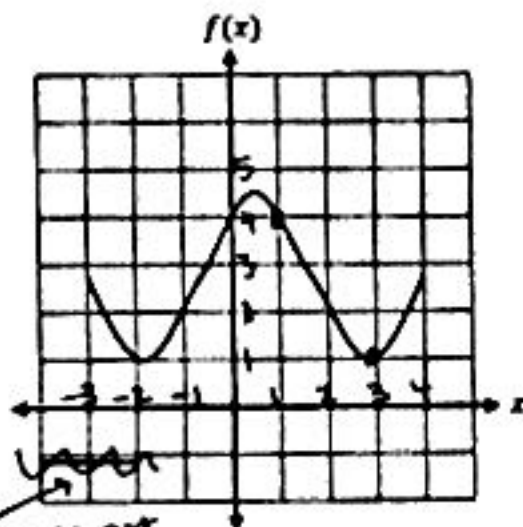
NO!



d. (2, 3), (6, 7), (8, 9), (12, 13)
 Yes



18. Answer each question below for the graph of $f(x)$. (Use a scale of one.)



This is not part of the graph!

- a. What is the Domain of the function? $-3 \leq x \leq 4$
 b. What is the Range of the function? $1 \leq y \leq 4.5$
 c. From what interval is the graph increasing? $-2 \leq x \leq 0.5$
 d. From what interval is the graph decreasing? $0.5 \leq x \leq 3$
 e. From what interval is the graph constant? None where
 f. What is $f(1)$? 4
 g. For what values of "x" does $f(x) = 2$? -1, 2, 3.5, -2.5
 (There can be multiple answers)
 h. What is the rate of change from $-4 \leq x \leq 2$? Wavy line
 i. What is the rate of change from $1 \leq x \leq 3$? $-\frac{3}{2}$

19. Solve for r , given a slope "m".

a. $m = (-3/5)$ and point $(-1, 5)$ and $(r, 2)$.

$$\frac{2-5}{r-1} = -\frac{3}{5} \quad \boxed{r=4}$$

b. $m = (1/2)$ and point $(0, 5)$ and $(4, r)$.

$$\frac{r-5}{4-0} = \frac{1}{2} \Rightarrow \boxed{r=5.5}$$

20. Find the slope given 2 points.

a. $(2, 5)$ and $(4, 10)$

$$\frac{10-5}{4-2} = \boxed{\frac{5}{2}}$$

b. $(-3, -6)$ and $(3, 3)$

$$\frac{3-(-6)}{3-(-3)} = \frac{9}{6} = \boxed{\frac{3}{2}}$$

c. $(15, 21)$ and $(15, 1)$

$$\frac{1-21}{15-15} = \frac{-20}{0}$$

undefined!!

$$\begin{aligned} 4 &= 2(r-5) \\ 4 &= 2r-10 \\ +10 & \quad +10 \\ \hline 14 &= 2r \\ \frac{14}{2} &= \frac{2r}{2} \\ 7 &= r \end{aligned}$$

21. Given Standard Form, convert to SLOPE-INTERCEPT form: (solve for "y")

$$\begin{array}{r} 4x - 2y = 10 \\ -4x \quad -4x \\ \hline -2y = 10 - 4x \\ -2 \quad -2 \\ \hline y = -5 + 2x \\ y = 2x - 5 \end{array}$$

$$\begin{array}{r} 3x + 5y = 3 \\ -3x \quad -3x \\ \hline 5y = 3 - 3x \\ \frac{5}{5}y = \frac{3}{5} - \frac{3x}{5} \\ y = -\frac{3}{5}x + \frac{3}{5} \end{array}$$

$$\begin{array}{r} -2x + y = 7 \\ +2x \quad +2x \\ \hline y = 7 + 2x \\ y = 2x + 7 \end{array}$$

$$\begin{array}{r} 3x + 2y = 6 \\ -3x \quad -3x \\ \hline 2y = 6 - 3x \\ \frac{2}{2}y = \frac{6}{2} - \frac{3x}{2} \\ y = 3 - \frac{3}{2}x \\ y = -\frac{3}{2}x + 3 \end{array}$$

$$y = -5 + 2x$$

$$y = -\frac{3}{5}x + \frac{3}{5}$$

$$y = 7 + 2x$$

$$y = 3 - \frac{3}{2}x$$

$$y = 2x - 5$$

$$y = -\frac{3}{5}x + \frac{3}{5}$$

$$y = 2x + 7$$

$$y = 3 - \frac{3}{2}x$$

$$y = -\frac{3}{2}x + 3$$

22. Mr. Lucas is filling his swimming pool. The pool is filling at a constant amount of gallons per minute. The data is perfectly linear.

Number of minutes passed (x)	Gallons of water in pool (y)
0	150
2	180
4	210
6	240
8	270

a. What is the y-intercept in this situation? 150

b. What does the y-intercept represent?

There were initially 150 gallons of water in the pool

c. What is the slope for this situation? $\frac{30}{2} = 15 \text{ ga/min}$

d. What does it mean in this situation?

15 gallons per minute is the rate the pool is filling.

e. Write a NOW-NEXT rule that describes the pattern in the table. Include start number.

Next = Now + 15 Start = 150

f. Write an equation in slope intercept form: $y = 15x + 150$

g. How many minutes does it take Mr. Lucas to empty the pool? Show work in the space provided

$$0 =$$