

Stations Review Key

Properties of Equality

Match the properties with the example that goes with it.

B 1. Commutative Property

A. If $a = b$ and $b = c$,
then $a = c$

D 2. Associative Property

B. $2 \times 8 \times 3 = 2 \times 3 \times 8$

E 3. Symmetric Property of Equality

C. $22a + 0 = 22a$

A 4. Transitive Property of Equality

D. $(4 + 9) + 5 = 4 + (9 + 5)$

C 5. Identity Property

E. If $a = b$, then $b = a$

6)

| Equation | Steps |
|----------------------|-----------------------------------|
| $3(x - 2) + 10 = 25$ | Original Equation |
| $3x - 6 + 10 = 25$ | 6. Distributive Property |
| $3x + 4 = 25$ | 7. Combine like terms/Associative |
| $3x = 21$ | 8. Subtraction POE |
| $x = 7$ | 9. Division POE |

Equations and Inequalities

1) $\frac{2x}{5} - 5 < 2x + 11$

$x > -10$

① $\frac{2x}{5} - 5 < 2x + 11$

$5 \cdot \frac{2x}{5} < 2x + 16 \cdot 5$

$2x < 10x + 80$

$-8x < 80$

$x > -10$

2) $2x + 4(7x - 3) - 8 = 5x - 30$

$2x + 28x - 12 - 8 = 5x - 30$

$30x - 20 = 5x - 30$

$25x = -10$

$x = \frac{-10}{25} = \frac{-2}{5}$

3) $\frac{x}{12} - \frac{3}{4} = \frac{1}{12}$

4) $-8x - 16 = -8(2x - 6)$

$-8x - 16 = -16x + 48$

$8x = 64$

$x = 8$

③ $\frac{x}{12} - \frac{3}{4} = \frac{1}{12}$

$12(\frac{x}{12} - \frac{3}{4}) = \frac{1}{12} \cdot 12$

$x - 9 = 1$

$x = 10$

5) $\frac{x}{2} - \frac{7}{10}$

$10x = 14$

$x = \frac{14}{10} = \frac{7}{5}$

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

Literal Equations

1) For y: $-12x + 4y = -8$

$4y = 12x - 8$

$y = 3x - 2$

2) W: $P = 2(L + W)$

$\frac{P}{2} = L + W$

$\frac{P}{2} - L = W$

3) For a: $ax + by = c$

$ax + by = c$

$ax = c - by$

$x = \frac{c - by}{a}$

4) For t: $P = \frac{t}{m^2} \cdot m^2$

$Pm^2 = t$

5) For z: $m = \frac{z(b+x)}{2}$

$2m = z(b+x)$

$\frac{2m}{b+x} = \frac{z(b+x)}{b+x}$

6) F: $C = \left(\frac{5}{9}\right)F - 32$

$C + 32 = \frac{5}{9}F$

$\left(\frac{9}{5}\right)(C + 32) = F$

$\frac{2m}{b+x} = z$

Word Problems

- 1) Sara wants to have an average of at least 90 on her tests. If she took three tests and earned an 84, 95, and 82, what is the lowest grade she has to earn on the fourth test?

$$4 \cdot \frac{84 + 95 + 82 + x}{4} = 90 \cdot 4$$

$$261 + x = 360$$

$$\boxed{x = 99}$$

- 2) Lola travelled to New York to visit her grandmother. When she arrived at the airport she had to take a taxi to her grandmother's house. The sign says the cost for the taxi is \$5.00 plus .20 a mile. Create an equation that models the situation. State what x and y represent in your equation.

Total cost $\rightarrow y = .2x + 5 \rightarrow$ miles driven

- 3) Jordan is trying to find the sum of 3 consecutive odd integers. Their sum is 249. Find the 3 numbers. Show all work.

$$x + x + 2 + x + 4 = 249$$

$$3x + 6 = 249$$

$$3x = 243$$

$$\boxed{x = 81}$$

- 4) The width of a rectangle is 4 inches more than the length. The perimeter is 56 inches. Find the length and width of the rectangle. You must show your algebraic equation and work to get credit!

$$2(w + 4) + 2w = 56$$

$$2w + 8 + 2w = 56$$

$$4w + 8 = 56$$

$$4w = 48$$

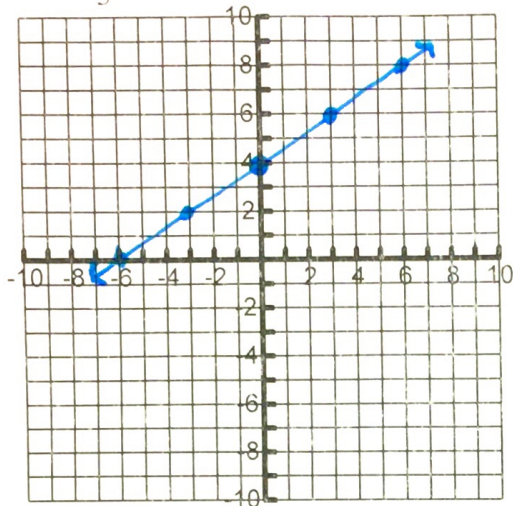
$$\boxed{w = 12}$$

$$2 \cdot L + 2 \cdot W = P$$

$$L = (w + 4)$$

Graphing:

1) $y = \frac{2}{3}x + 4$

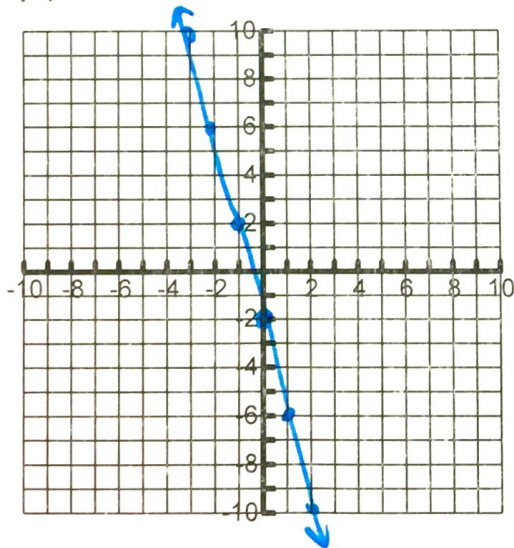


- State the Domain
- State the Range
- State the y intercept
- State the x intercept
- Create a table that shows all the values of the function from -6 to 6

Domain: $(-\infty, \infty)$
 Range: $(-\infty, \infty)$
 x int: $(-6, 0)$
 y int: $(0, 4)$

| x | y |
|----|---------------|
| -6 | 0 |
| -5 | $\frac{2}{3}$ |
| -4 | $1.\bar{3}$ |
| -3 | 2 |
| -2 | $2.\bar{6}$ |
| -1 | $3.\bar{3}$ |
| 0 | 4 |
| 1 | $4.\bar{6}$ |
| 2 | $5.\bar{3}$ |
| 3 | 6 |
| 4 | $6.\bar{6}$ |
| 5 | $7.\bar{3}$ |

2) $y = -4x - 2$



- State the Domain
- State the Range
- State the y intercept
- State the x intercept
- Create a table that shows all the values of the function from -6 to 6

D: $(-\infty, \infty)$
 R: $(-\infty, \infty)$
 y-int: $(0, -2)$
 x-int: $(-\frac{1}{2}, 0)$

| x | y |
|----|-----|
| -6 | 22 |
| -5 | 18 |
| -4 | 14 |
| -3 | 10 |
| -2 | 6 |
| -1 | 2 |
| 0 | -2 |
| 1 | -6 |
| 2 | -10 |
| 3 | -14 |
| 4 | -18 |
| 5 | -22 |
| 6 | -26 |

$$0 = -4x - 2$$

$$2 = -4x$$

$$-\frac{1}{2} = x$$

6 | 8

Arithmetic Sequences

To get the function, just simplify the explicit formula so its in slope form $y = mx + b$

| Representation | Common Difference | Explicit Formula | Recursive Formula | Given Term |
|---|-------------------|---|-----------------------|-----------------|
| 20. -10, -3, 4, ... | +7 | $a_n = -10 + 7(n-1)$ $f(n) = 7n - 17$ | $a_n = a_{n-1} + 7$ | a_{17} 102 |
| 21. Camden is collecting bugs for science class. The first day his sister helps him, and he finds 35 bugs. After day 2, he has 51 bugs. On day 3, he has 67 bugs. | +16 | $a_n = 35 + 16(n-1)$ $f(n) = 16n + 19$ | $a_n = a_{n-1} + 16$ | a_5 99 |
| 22. A museum usually has 4,000,000 visitors. They made some changes to increase visitors. The table shows the projected annual visitors to museum (in millions) after the changes. What is the projected number of visitors in 8 years? | +1.5 million | $a_n = 5.5 + 1.5(n-1)$ $f(n) = 1.5n + 4$ | $a_n = a_{n-1} + 1.5$ | a_8 16 |

| Year | Visitors (millions) |
|------|---------------------|
| 0 | 4 |
| 1 | 5.5 |
| 2 | 7 |
| 3 | 8.5 |
| 4 | 10 |
| n | |

Functions and Rate of change

Write an equation for the function in the table.

hint Determine the slope using the slope formula. Find the y intercept from the table.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{6-4}{1-0} = \frac{2}{1} = 2$$

m

| | | | | | | |
|-------------------|---|---|---|----|----|----|
| Time (years) | 0 | 1 | 2 | 3 | 4 | 5 |
| Number of Rabbits | 4 | 6 | 8 | 10 | 12 | 14 |

← y int is when x=0

$$y = 2x + 4$$

$$y = mx + b$$

Use the following functions to find the given value or expression:

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

$$g(x) = \frac{1}{2}x + 1$$

$$h(x) = 2x^2 - 3$$

$$m(x) = 3 - x$$

1) $f(0) = \underline{2}$

$$2(g(x)) = (x+2) + 3f(x) = (3x+6)$$

5) $2g(x) + 3f(x) = \underline{4x+8}$

2) $g(8) = \underline{5}$

6) $(f+g)(x) = \underline{1.5x+3}$

3) $h(2) = \underline{5}$

7) $(f-m)(x) = \underline{2x-1}$

4) $g(2) + h(2) = \underline{7}$

$$g(2) = \frac{1}{2}(2) + 1$$

$$h(2) = 2(2)^2 - 3$$

$$1 + 1$$

$$8 - 3$$

$$2$$

$$5$$

$$g(2) + h(2) = 2 + 5$$

More on Functions

Find the following values:

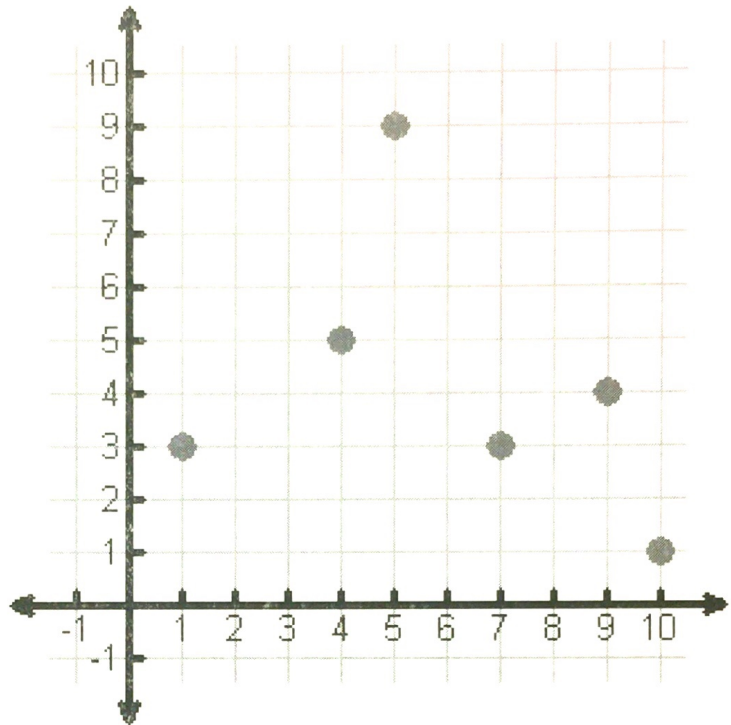
$g(1) = \underline{3}$

$g(5) = \underline{9}$

$g(10) = \underline{1}$

$g(\underline{4}) = 5$

$g(\underline{9}) = 4$



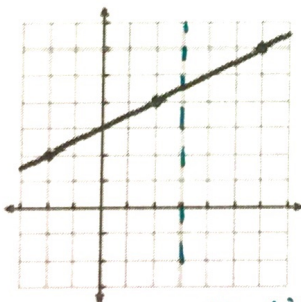
State if the following is a relation or a function, then state why.

1) $\{(5,2) (6,3) (7,4) (8,3)\}$
 Yes, each x-value is paired with only one y-value.

2) **NO** - the x-value 3 is paired w/ both 4 and -3.

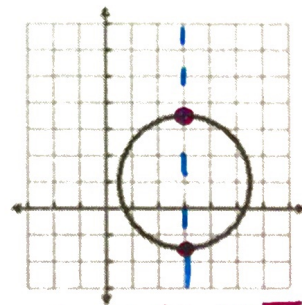
| | | | | |
|--------|---|----|---|----|
| input | 3 | 2 | 0 | 3 |
| output | 4 | -1 | 2 | -3 |

3)



Yes, passes vertical line test. (VLT)

4)



NO! Fails VLT.
 meaning: The x-value 3 is paired w/ 3.5 and -1.5.