

Round the following numbers to the nearest thousandth:

1. 24.657201

24.657

2. 4.7455

4.746

Solve the following for x and round to the nearest thousandth. Circle your final answer.

3. $3(2x+5)-(12x-4)=10$

$6x+15-12x+4=10$

$-6x+19=10$

$-6x=-9$

$x = \frac{-9}{-6} = 1.5$

4. $\left(5 = \frac{3}{2}x + \frac{5}{7}x\right) \cdot 14$

$70 = 21x + 10x$

$70 = 31x$

$x \approx 2.258$

5. $2x+7y=z$

$2x = z - 7y$

$x = \frac{z-7y}{2}$

6. $n = 2(cx^2 - g) + 4$

$\frac{n-4}{2} = \frac{2(cx^2 - g)}{2}$

$\frac{n-4}{2} = cx^2 - g$

$\frac{n-4}{2} + g = cx^2$

$\frac{\frac{n-4}{2} + g}{c} = x^2$

7. If I were writing a word problem where the independent variable is how often you work out, what is an example of something that could be a dependent variable?

The number of calories you burn

8. Find the average rate of change between $x = -2$ and $x = 7$

x	-2	0.5	2.5	3	4.5	7
y	-5	-8	-9.3	-14	-21.7	33

$AROC = \frac{y_2 - y_1}{x_2 - x_1} = \frac{33 - (-5)}{7 - (-2)} = \frac{38}{9} = 4.2$

9. Find AROC for the points (13, 4) and (-8, 12.6); Nearest thousandth

$\frac{12.6 - 4}{-8 - 13} = \frac{8.6}{-21} \approx -0.41$

Write the explicit formula and the recursive formula for the following sequence.

10. $\{8, 5, 2, -1, \dots\}$

$$a_n = a_1 + (n-1)d$$

$$\begin{cases} a_1 = 8 \\ a_n = a_{n-1} - 3 \end{cases}$$

Recursive Formula

$$a_n = 8 + (n-1)(-3)$$

Explicit Formula

11. Find the missing terms of the following arithmetic sequence.

$$19, \underline{15.625}, \underline{12.25}, \underline{8.875}, 5.5$$

$$19 + 4d = 5.5$$

$$4d = -13.5$$

$$d = -3.375$$

12. Key Club decided to sell cupcakes in hopes to raise money. The following function represents the Profit, P , in terms of how many cupcakes they sell, n .

$$P(n) = -50 + 3n$$

a. What is the rate of change and what does it mean in the context of the situation?

3 \rightarrow They make \$3 profit for each cupcake they sell.

b. What is the y-intercept and what does it mean in the context of the situation?

-50. They lose \$50 if they don't sell any cupcakes.

c. If Key Club sells 220 cupcakes, what will their profit be? Show your work.

$$P(220) = -50 + 3(220) = -50 + 660 = \boxed{\$610}$$

d. Key Club ended up making a profit of \$226, how many cupcakes did they end up selling? Show your work.

$$226 = -50 + 3n$$

$$276 = 3n$$

$$\boxed{n = 92 \text{ cupcakes}}$$

e. Give the practical domain of the situation.

$$\boxed{0, 1, 2, \dots}$$

f. Give the practical range of the situation.

$$-50, -47, -44, \dots$$

13. Match the following correlation coefficients to the scatter plots below:

a. $r = -0.87$

3

b. $r = 0.79$

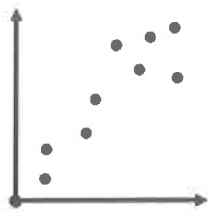
4

c. $r = 0.91$

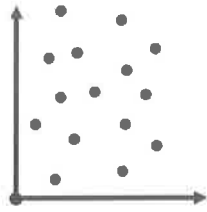
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d. $r = -0.15$

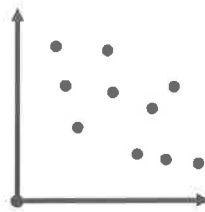
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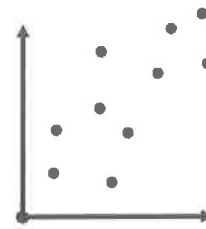
1.



2.



3.



4.

14. Find the equation in point-slope form that would pass through the coordinates $(-2, 8)$ and $(5, -6)$.

$$y - y_1 = m(x - x_1)$$

$$m = \frac{-6 - 8}{5 - (-2)} = \frac{-14}{7} = -2$$

$$y - 8 = -2(x + 2) \text{ or } y + 6 = -2(x - 5)$$

15. For the following 2 scenarios tell whether the situation is a correlation or causation. Explain your answer. Be sure to include a lurking variable if appropriate.

a. The amount you brush your teeth and the number of cavities you have.

Causation. Brushing your teeth more causes you to have less cavities.

b. The number of snow days and the number of eggs sold at Marcs

Correlation. one does not cause the other one.

Perhaps people just do more baking in winter & that's also when we get snow days.

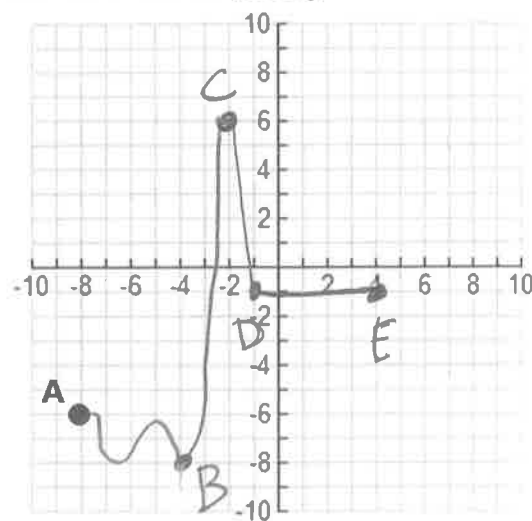
16. Sketch a graph that matches the characteristics of the average rate of change given:

Between points A and B: small, negative rate

Between points B and C: large, positive rate

Between points C and D: large, negative rate

Between points D and E: no change



17. Graph the following on the coordinate plane.

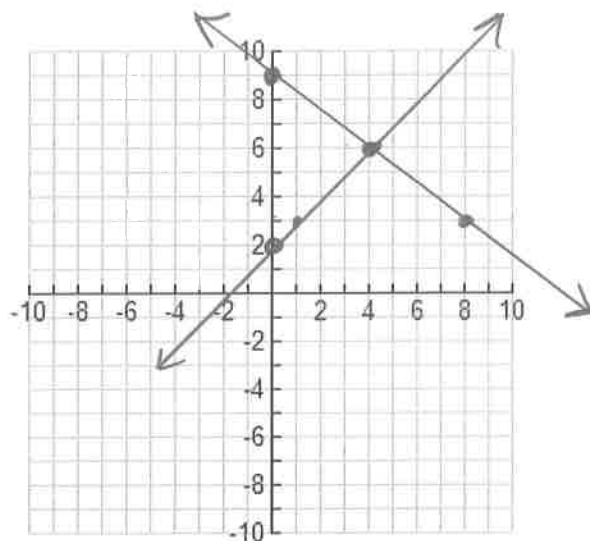
$$\begin{cases} y = -\frac{3}{4}x + 9 \\ -5x + 5y = 10 \end{cases}$$

$$5y = 10 + 5x$$

$$y = 2 + x$$

What is the solution to the system?

(4, 6)



For 18 and 19, use the substitution or elimination method to solve the following:

Sub

18.

$$\begin{cases} y = -3x + 5 \\ 5x - 4y = -3 \end{cases}$$

$$5x - 4(-3x + 5) = -3$$

$$5x + 12x - 20 = -3$$

$$17x = 17$$

$$x = 1$$

$$y = -3(1) + 5$$

$$y = 2$$

$$\boxed{(1, 2)}$$

20. $f(x) = 3000(1.026)^x$

21. $5700 = 3000(1.026)^x$

$$\boxed{x \approx 25 \text{ years}}$$

Elim

19.

$$\begin{cases} 2x + 8y = -12 \\ (-2) \times -3x + 4y = 30 \end{cases}$$

$$8x = -72$$

$$x = -9$$

$$2(-9) + 8y = -12$$

$$-18 + 8y = -12$$

$$8y = 6$$

$$y = \frac{6}{8} = \frac{3}{4}$$

$$\boxed{(-9, \frac{3}{4})}$$