

Key

1. Which value of x satisfies the equation $\frac{2}{5}\left(x + \frac{3}{10}\right) = 30$?

Correct Choice Not Given

(a) 83.25

(b) 74.4

(c) 70.3

(d) 72

$$x = 74.7$$

$$x + \frac{3}{10} = 30$$
$$\frac{2}{5}$$

$$x + \frac{3}{10} = 75$$
$$-\frac{3}{10} \quad -\frac{3}{10}$$

$$x = 74\frac{7}{10}$$

2. Cooper has 15 Thomas and Friends trains at home. He collects three more each week. Write an equation to show the amount of trains he would have after a given amount of time.

$$y = 3x + 15$$

3. Cooper's best friend Chase has 20 trains at home but he only collects two more each week. Write an equation to show the amount of trains Chase has after a given amount of time. What do you notice about their slopes and their y-intercepts?

$$y = 2x + 20$$

Cooper's slope is larger by
Chase's y-intercept is larger

4. Determine if the point (3, 5) lies in the solution set of $y \leq 3x - 2$ and $y > -2x + 1$.

$$5 \leq 3(3) - 2 \quad 5 > -2(3) + 1$$

$$5 \leq 7 \quad 5 > -5$$

✓

✓

True

5. Give an example of the distributive property.

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

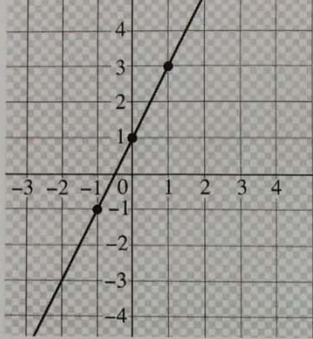
Give an example of the commutative property.

$$x+y = y+x$$

Give an example of the associative property.

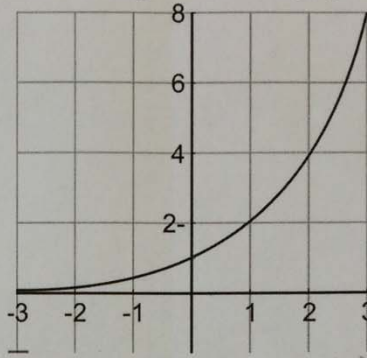
$$(a+b)+c = a+(b+c)$$

6. Write the equation of the graph below.



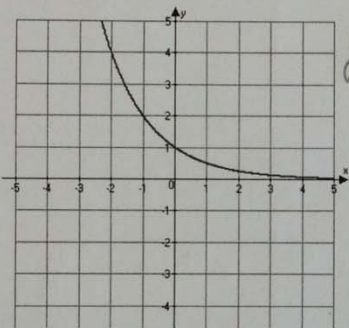
$$y = 2x + 1$$

7. Write the equation of the graph below.



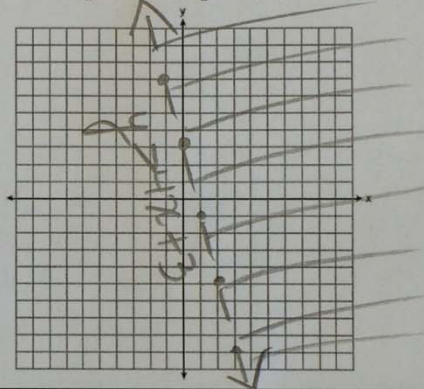
$$y = 1(2)^x$$

8. Write the equation of the graph below.



$$y = 1\left(\frac{1}{2}\right)^x$$

9. Graph the inequality $y > -4x + 3$.



10. Write 6.08 million in scientific notation.

$$6.08 \times 10^6$$

11. If there are 6.08 million minions that live with Gru. If each year the population of minions grows by 2.4%, write an equation to represent the population 5 years from now.

$$y = (6.08 \times 10^6)(1.024)^x$$

12. Find the average rate of change over the interval $0 \leq x \leq 2$ for each of the following.

$$a(x) = x^2$$

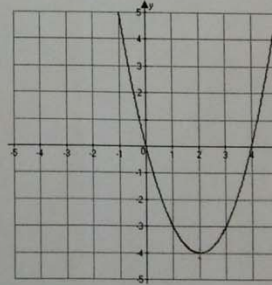
$$\begin{matrix} 0, 0 \\ 2, 4 \end{matrix} \quad \frac{4-0}{2-0} = \frac{4}{2}$$

$$m = 2$$

x	b(x)
0	0
1	3
2	7
3	11

$$\frac{7-0}{2-0} = \frac{7}{2}$$

$$m = 3.5$$



$$\begin{matrix} 0, 0 \\ 2, -4 \end{matrix}$$

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

$$m = -2$$

13. Simplify the following expression:

$$2(x-1)^2 - 4(x-5)$$

$$\begin{array}{r|cc} x & -1 & \\ \hline x & x^2 & -x \\ -1 & -x & 1 \end{array}$$

$$2(x^2 - 2x + 1) - 4(x - 5)$$

$$2x^2 - 4x + 2 - 4x + 20$$

$$\boxed{2x^2 - 8x + 22}$$

14. Define rational and irrational.

Rational → Can be written as a fraction.

Irrational → Non Terminating, Non Repeating Decimal Numbers

15. Simplify:

(a) x^{-4} (b) 3^{-5} (c) $3x^{-2}$

a) $\frac{1}{x^4}$

b) $\frac{1}{3^5}$

c) $3 \cdot \frac{1}{x^2} = \frac{3}{x^2}$

16. Simplify the expression and write your answer in standard form.

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

$$10x^2 - 35x$$

$$\begin{array}{r|cc} & x+3 & \\ \hline 4x & 4x^2+12x \\ -2 & -2x-6 \end{array}$$

$$10x^2 + 35x + 4x^2 + 10x - 6 + 5x^3$$

$$\boxed{5x^3 + 14x^2 + 45x - 6}$$

17. Wildlife biologists are tracking the population of albino deer in an upstate New York forest preserve. They record the population every year since 2005, which they consider to be $t=0$. Their data is shown in the table below.

Year	2005	2006	2007	2008	2009	2010
t	0	1	2	3	4	5
Population	86	98	111	128	147	168
		+12	+13	+17	+19	+21

If you wanted to create an equation for this information, would you use a linear function or an exponential function? Explain your reasoning.

Exponential Function because even though the growth factor is not exact, it is pretty close to consistent, where we are consistently adding more each time we add.

18. Jaclyn wants to sell bracelets and earrings to make some extra money for her vacation. She wants to make at least \$500 and knows she will only have time to make at most 50 pieces of jewelry. Each bracelet costs \$2 and each pair of earrings costs \$3. (a) Write a system of inequalities that represent this situation. (b) She sells 32 bracelets and 12 pairs of earrings. Is this combination enough to make the extra \$500?

Let $B = \#$ of Bracelets
 Let $E = \#$ of Earrings

a) $B + E \leq 50$
 $2B + 3E \geq 500$

b) $2(32) + 3(12) \geq 500$
 $100 \not\geq 500$
 No.

19. How can you determine if a sequence is arithmetic or geometric?

Arithmetic \rightarrow add the same # to get the next # (Common Difference)

Geometric \rightarrow Multiply by the same # to get the next # (Common Ratio)

20. Determine if each of the following is arithmetic or geometric. If it is arithmetic state the common difference and if it is geometric state the common ratio.

(a) 2, 4, 6, 8, ...

Arithmetic

$d = +2$

(b) -5, 10, -20, 40, ...

Geometric

$r = -2$

(c) 18, 15, 12, ...

Arithmetic

$d = -2$

(d) 50, 10, 2, ...

Geometric

$r = \frac{1}{5}$

21. Juliana got a Barbie Doll for her birthday that has hair that grows a certain amount each day. She recorded the data in the table below.

Day	0	1	2	3	4	5
Hair growth (cm)	5.5	8	10.5	13	15.5	18

+2.5 +2.5 +2.5 +2.5

The Barbie Dolls hair continues to grow at a constant daily rate. Write an equation $g(n)$, the growth of the hair on the n th day.

$g(n) = 2.5n + 5.5$