Domain Assessment • **Expressions and Equations**

1. Which expression is equal to $(12^4)^{-2}$?

A. 12^{-6}

B. 12^{-8}

C. 12^{6}

D. 12^{8}

2. What is $\sqrt[3]{64}$?

A. 2

B. 4

C. 8

D. 16

3. Which is equal to $\sqrt{81}$?

A. 6

B. 7

C. 8

D. 9

4. Which is 23,578,000 written in scientific notation?

A. 2.3578×10^{6}

B. 23.578×10^{6}

C. 2.3578×10^{7}

D. 23.578×10^{7}

5. Which is the quotient of $\frac{4.18 \times 10^{8}}{1.1 \times 10^{-2}}$?

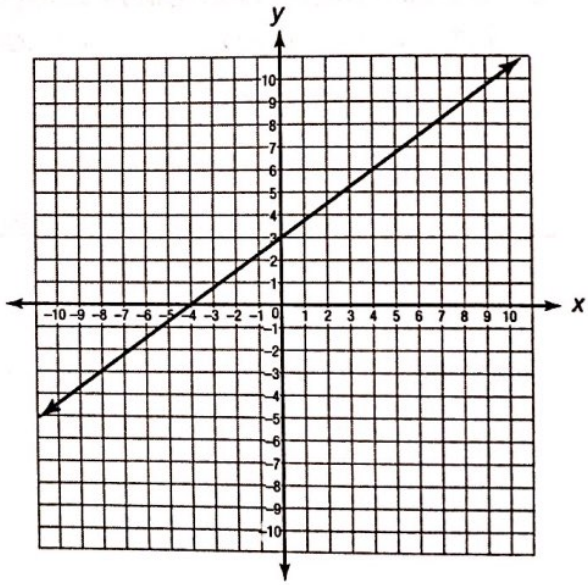
A. 3.8×10^{6}

B. 3.8×10^{10}

C. 3.8×10^{14}

D. 3.8×10^{16}

6. Below is the graph of a line.



Which is the slope of the line?

A. $\frac{1}{2}$

B. $\frac{3}{4}$

C. $\frac{3}{3}$

D. 3

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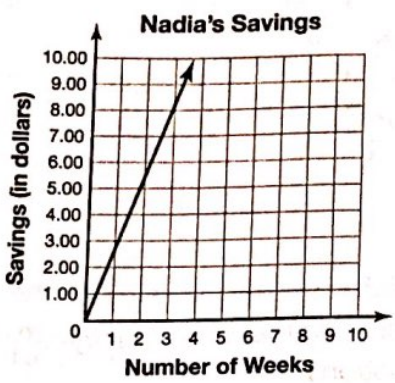
7. Nadia has a savings account that earns interest at a rate of $2.75 every week. Which graph shows Nadia's earnings over time?

A.



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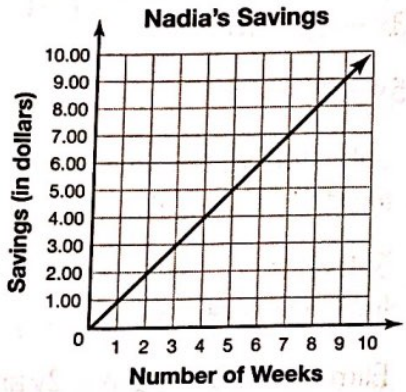

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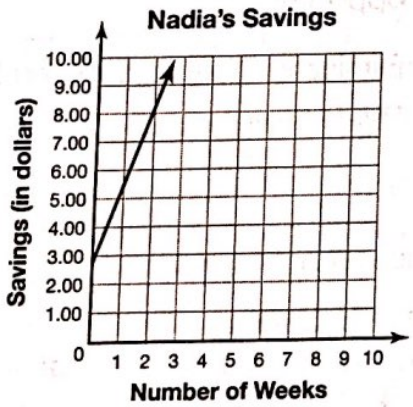

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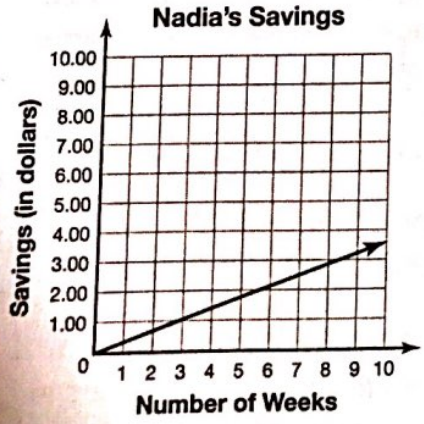

8. Sunil wants to find a side length of a cube with a volume of 27 cubic units. To find the length of one side, Sunil sets up the following equation: $s^3 = 27$. Which equation below shows the correct value of s?

A. $s = \sqrt{27}$

B. $s = \sqrt[3]{3}$

C. $s = 3^3$

D. $s = \sqrt[3]{27}$

9. What is the solution to $3x + 1 = 4x - 6$?

A. $x = 5$

B. $x = 6$

C. $x = 7$

D. $x = 8$

10. During a presentation at the Battelle Planetarium, Magdalena learned that the average distance between Earth and the sun is approximately 9.3×10^7 miles. What is the average distance between Earth and the sun in standard form?

A. 93,000 miles

B. 930,000 miles

C. 9,300,000 miles

D. 93,000,000 miles

Expressions and Equations

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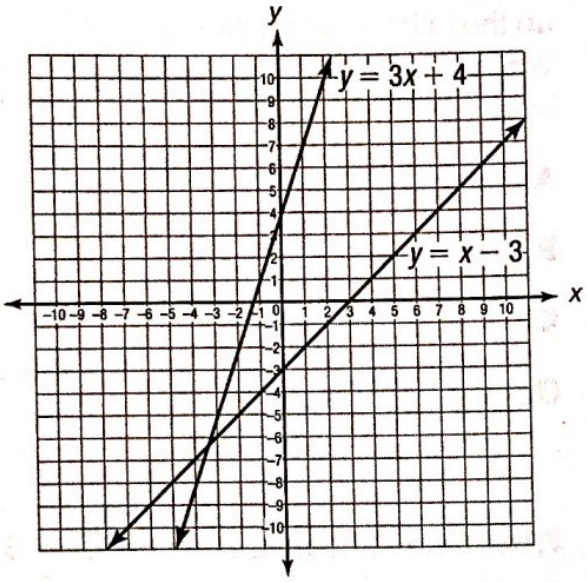
11. The equations $y = 3x + 4$ and $y = x - 3$ are graphed below.



What is the solution to this system of linear equations?

A. $(-3.5, -6.5)$

B. $(-3.5, 6.5)$

C. $(3.5, -6.5)$

D. $(3.5, 6.5)$

12. Neptune is one of the larger planets, with a mass of approximately 1×10^{26} kg. Mercury is the smallest planet, with a mass that is approximately 3×10^{23} kg. About how many times larger than Mercury is Neptune?

A. 333

B. 3,333

C. 33,333

D. 333,333

13. Solve for x: $-3(2x + 1) + 3x = 6x + 3$

A. $-\frac{1}{3}$

B. $-\frac{2}{3}$

C. $\frac{1}{3}$

D. $\frac{2}{3}$

14. Which is the best way to find the solution to the following system of linear equations?

$$3x - 2y = 18$$

$$5x + 2y = 14$$

A. Substitution, because you can easily find the value of x.

B. Substitution, because you can easily find the value of y.

C. Elimination, because $-2y$ and $2y$ are opposites.

D. Elimination, because $3x$ and $5x$ are opposites.

15. Which term is equivalent to $\frac{2^{-3}}{2^2}$?

A. $\frac{1}{32}$

B. $\frac{1}{8}$

C. $\frac{1}{2}$

D. 2

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16. In 2012, with approximately 8.1×10^6 people, New York City is the most populous city in the United States. Los Angeles, California, is the second most populous city in the United States, with about 3.8×10^6 people. Approximately, what is the population of the two most populous cities in the United States combined?

A. 1.1×10^6

B. 1.9×10^6

C. 1.19×10^7

D. 11.9×10^7

17. What is the solution to $x + 11 + 2x = 7 + 3x + 4$?

A. $x = 0$

B. $x = 6$

C. no solution

D. infinitely many solutions

18. Loretta calculated the distance she drove from home to her grandmother's house as 5.11×10^5 cm. The distance from Loretta's home to her aunt's house is 5.3×10^7 cm. Which sentence is correct?

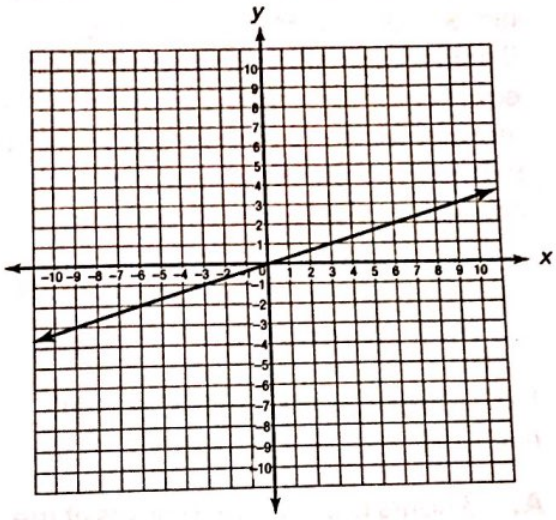
A. Loretta lives closer to her grandmother than to her aunt.

B. Loretta lives closer to her aunt than to her grandmother.

C. Loretta lives farther away from her grandmother than from her aunt.

D. Loretta lives the same distance from her aunt and from her grandmother.

19. Tariq graphed a proportion on the plane below.



What are the equation and the y-intercept of the proportion?

A. $y = x$; (0, 3)

B. $y = x + 3$; (0, 3)

C. $y = \frac{1}{3}x$; (0, 0)

D. $y = \frac{1}{3}x$; (0, 1)

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20. Aidan earned a total of \$117 in one week. His babysitting job pays him \$15 per hour. His after-school job at a barber shop pays him \$9 per hour. He worked a total of 9 hours that week. The system of linear equations represents this situation, where x represents the number of hours Aidan spent babysitting and y represents the number of hours he worked at the barber shop.

$$x + y = 9$$

$$15x + 9y = 117$$

How many hours did Aidan work at each job?

A. 3 hours babysitting, 6 hours at the barber shop

B. 6 hours babysitting, 3 hours at the barber shop

C. 9 hours babysitting, 15 hours at the barber shop

D. 15 hours babysitting, 9 hours at the barber shop

21. What is the solution to $3.25x + 1 - 4.25x = -2$?

A. -3.0

B. 0.4

C. 3.0

D. 4.0

22. Ms. Prevost wrote a system of linear equations on the board and asked her students how many solutions it had.

$$y = 3x + 4$$

$$y = 3x + 7$$

Abby said it had no solution because the two lines are parallel and therefore cannot intersect. Ileana said it had no solution because $3x - y$ cannot equal both -4 and -7. Jun said there were infinitely many solutions because they are the same line.

Who is correct?

A. Abby

B. Ileana

C. Jun

D. both Abby and Ileana

23. A micrometer is equal to 1.0×10^{-6} meters. Which of the following would best be measured in micrometers?

A. the distance between two planets

B. the height of a coffee table

C. the length of a pencil

D. the width of a strand of hair

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24. 323 tickets were sold at a school talent show to both adults and children. The school earned \$837 from these ticket sales. Adult tickets cost \$5 each and children's tickets cost \$2 each. Which system of linear equations represents this situation?

A. $a + c = 7$
$323a + c = 837$

B. $a + c = 323$
$2a + 5c = 837$

C. $a + c = 323$
$5a + 2c = 837$

D. $a + c = 837$
$5a + 2c = 323$

25. Which equation can be used to show the slope of a line with the points $(-2, 5)$ and (x, y)?

A. $m = \frac{y-5}{x-2}$

B. $m = \frac{x-2}{y-5}$

C. $m = \frac{y-5}{x+2}$

D. $m = \frac{x+2}{y-5}$

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