



Graphing Linear Equations on a Coordinate Plane

You have learned to graph linear equations by making a table of values and then graphing the resulting coordinates. The table of values can include negative numbers as well as positive numbers. Negative numbers can also be graphed on a coordinate graph.

First, decide on a value for x , then compute a corresponding value for y in the table of values. Repeat for each row in the table of values. Use each (x, y) pair to plot a point on the graph. Connect the points to finish graphing the equation.

Let's graph the equation $-3x - 1 = y$.

If x is 0, then y will be -1
because $-3(0) - 1 = -1$.

If x is -2 , then y will be 5
because $-3(-2) - 1 = 5$.

x	y
0	-1
2	-7
-2	5

If x is 2, then y will be -7
because $-3(2) - 1 = -7$.

$$-3x - 1 = y$$

$$2x - 6 = y$$

We can graph a second equation on the same graph.

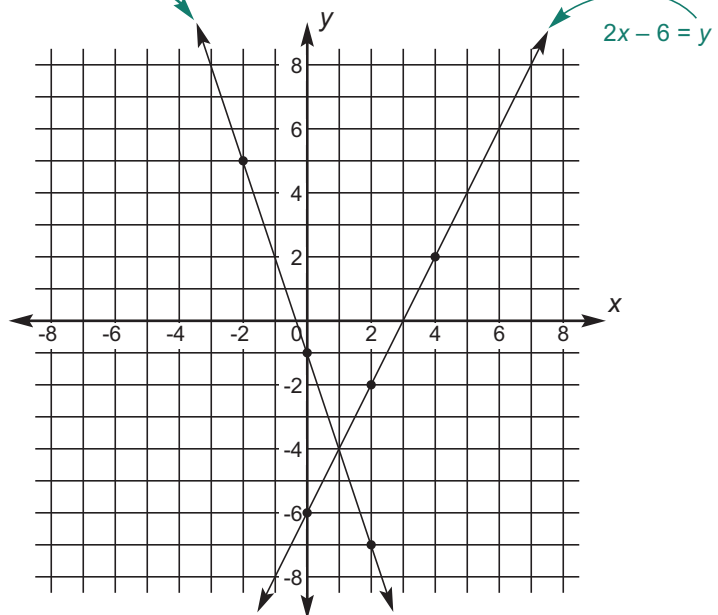
Graph the equation $2x - 6 = y$.

$$2(0) - 6 = -6$$

$$2(2) - 6 = -2$$

$$2(4) - 6 = 2$$

x	y
0	-6
2	-2
4	2



Notice where the two lines intersect on the graph. The point of intersection is $(1, -4)$.

Lesson 6

Solve the equation for each x value and complete the tables. Graph the solutions and fill in the blank below.

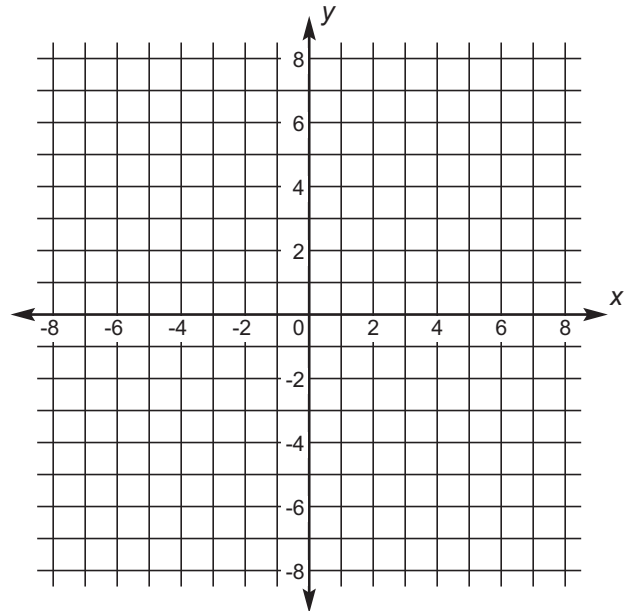
1. $\frac{x}{2} - 4 = y$

x	y
0	
4	
-4	

Remember: $x = 1x$,
so $-x = -1x$.

2. $-x + 5 = y$

x	y
0	
2	
4	



3. The point of intersection is _____.



We Remember

4. Dry Gulch Landscaping uses diamond blades for cutting pavers and wall blocks. Victor bought 2 blades priced at \$149.99 each, rather than the generic brand of blades costing \$79.99 each, because he knew that the brand name blades lasted at least twice as long as the generic brand. How much less would it cost to buy one expensive blade instead of two cheaper blades? _____

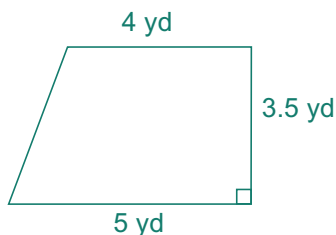
Translate the phrases into equations. Use n for the variable.

- The quotient of sixteen and a number is four. _____
- Seven less than a number is six. _____
- A number increased by two is eight. _____
- A number squared less nine is sixteen. _____

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9. The longest side of a right triangle is called the _____.
10. The formula for finding the volume of a cylinder is _____.
11. Like terms must have the same _____ with the same _____.
12. The difference between the highest and the lowest of the data is the _____.
13. a. 1 quart = _____ fluid ounces b. 1 gallon = _____ fluid ounces
14. a. $\frac{3}{8} =$ _____% b. $\frac{1}{3} =$ _____% c. $\sqrt{144} =$ _____ d. $2^4 =$ _____

Use the formula to find the area of the trapezoid.



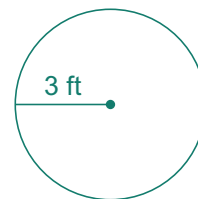
15. _____

16. Dry Gulch is mulching circles around 9 young trees. Each circle has a radius of 3 feet, and Craig is applying the mulch 2 inches thick.

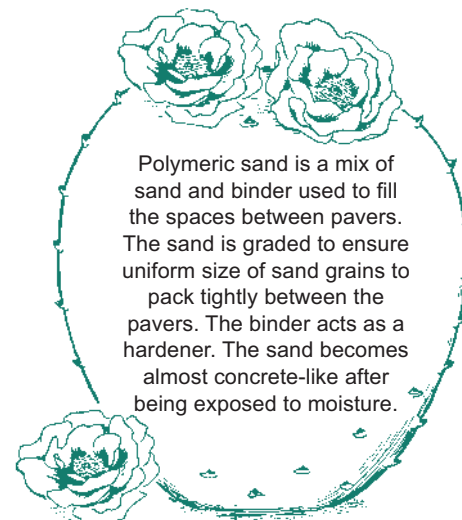


a. Without subtracting anything for the tree in each center, how many cubic yards of mulch will it take to mulch each tree? Round to the nearest tenth.

b. How much mulch will be needed for all 9 trees? _____



17. Victor used a special type of sand called polymeric sand to fill in the joints between the flagstones on the patio and sidewalk on the Tice job. The polymeric sand comes in 66-lb bags with 56 bags on a skid. How much does a full skid of polymeric sand weigh? _____



Polymeric sand is a mix of sand and binder used to fill the spaces between pavers. The sand is graded to ensure uniform size of sand grains to pack tightly between the pavers. The binder acts as a hardener. The sand becomes almost concrete-like after being exposed to moisture.

Lesson 6

+ *Skill Builders* **-**

$$\frac{5}{6}$$

$$2\frac{1}{4}$$

18. a. $3\frac{1}{6} \times 3 \times 4\frac{2}{3} = \underline{\hspace{2cm}}$

b. $4.3 \overline{)8.944}$

c. $\underline{+7\frac{2}{3}}$

Combine like terms.

19. a. $2b + 3c - 3b - 5b - 2c$

b. $7x^3 + 4x^2 + x^3 - 9x^3 - 2x^2$

c. $\frac{6x - 4y - 3}{3x}$

List the prime factors with exponents, list each factor with the largest exponent, and find the LCM.

20. a. $88 = \underline{\hspace{2cm}}$

c. $\underline{\hspace{2cm}}$

d. LCM = $\underline{\hspace{2cm}}$

b. $80 = \underline{\hspace{2cm}}$

Reduce to simplest form.

21. a. $\frac{6a^3b}{2ab^3} =$

b. $\frac{x^4}{10x^5} =$

Find the mean, median, and mode. Round to the nearest whole.

4, 5, 7, 2, 3, 5, 3, 2, 6, 5

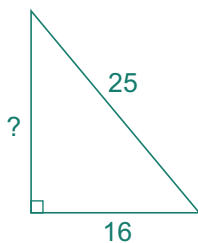
22. a. mean $\underline{\hspace{2cm}}$

b. median $\underline{\hspace{2cm}}$

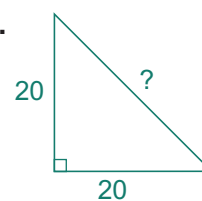
c. mode $\underline{\hspace{2cm}}$

Use the Pythagorean Theorem to find the missing length. Round irrational roots to the nearest tenth.

23. a.



b.



Lesson 7

To change a number from scientific notation into standard form, follow these steps:

1. If the exponent is positive, move the decimal point that many places to the *right* (like the positive direction on a numberline), adding zeros for placeholders.
2. If the exponent is negative, move the decimal point that many places to the *left* (like the negative direction on a numberline), adding zeros for placeholders.

$$5.034 \times 10^{12} = 5034000000000. \text{ Positive exponent} \rightarrow \text{move decimal point 12 places to the right.}$$

$$3.007 \times 10^{-8} = 0.00000003007 \text{ Negative exponent} \rightarrow \text{move decimal point 8 places to the left.}$$

To change a number from standard form into scientific notation follow these steps:

1. Move the decimal point over until there is only one non-zero number to the left of it.
2. Drop any zeros not needed for placeholders.
3. Multiply by a power of ten which shows how many places you moved the decimal point. Use a positive exponent if the original number is greater than 1. Use a negative exponent if the original number is less than 1.

<div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">1</div> 9,823,000,000	<div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">2</div> 9.823	<div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">3</div> $\times 10^9$	=	9.823×10^9
0.0000401	4.01	$\times 10^{-5}$	=	4.01×10^{-5}

Change the following numbers to standard notation.

- | | |
|----------------------------------|----------------------------------|
| 1. a. $4.21 \times 10^6 =$ _____ | b. $9.04 \times 10^{-4} =$ _____ |
| 2. a. $8 \times 10^{11} =$ _____ | b. $3.2 \times 10^{-3} =$ _____ |

Change the following numbers to scientific notation.

- | | |
|----------------------------------|------------------------|
| 3. a. 78,300,000 = _____ | b. 0.000067 = _____ |
| 4. a. 22,000,000,000,000 = _____ | b. 0.000000003 = _____ |



We Remember

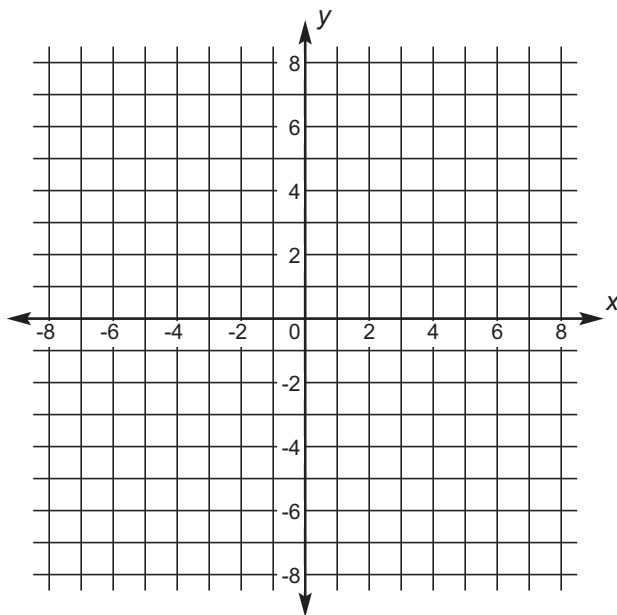
Solve.

- | | | |
|------------------------------|----------------------------|---------------------------|
| 5. a. $-72 \div -12 =$ _____ | b. $\frac{-34}{8} =$ _____ | c. $13 \times -3 =$ _____ |
|------------------------------|----------------------------|---------------------------|

Complete the tables of values and graph the equations.

6. $\frac{-2x}{4} = y$

x	y
0	
4	
-4	



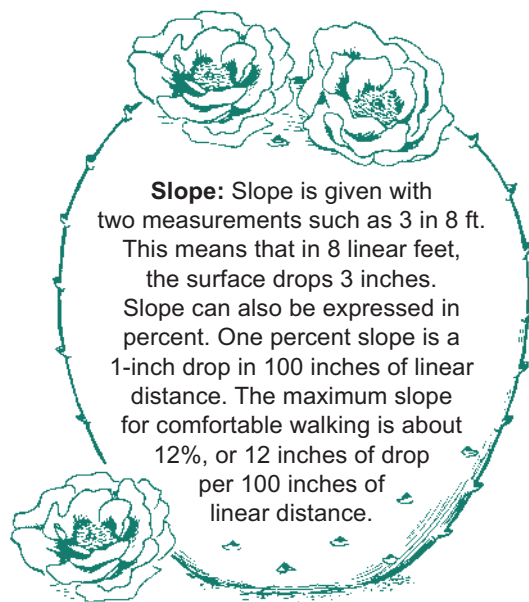
7. $\frac{-2x}{4} + 2 = y$

x	y
0	
4	
-4	

8. Victor wants Mr. Tice’s patio to slope away from the house so that rainwater will drain away from the house. If the patio slopes 1 inch for every 3 feet, and the finished patio will be 15 feet wide, how many inches will it slope?

9. Use the volume formula and a proportion to solve. The conversion factor is $1 \text{ ft}^3 \approx 7.5 \text{ gal}$.

9. Dry Gulch Landscaping laid pavers around a rectangular fountain in a local park. The fountain was 32 feet wide and 52 feet long and held 18 inches of water. How many gallons of water were in the fountain? _____



10. Juan calculated the number of stones needed to lay a wall 42 feet long. How many 17-inch-long capstones did he need to purchase to put the cap layer on the wall? Round to the next whole stone. _____

Lesson 7

Solve. Leave non-perfect squares under the radical sign.

11. a. $108 = 9x^2$

b. $3z \cdot 5z + 3 = 93$

c. $96 = 6(c^2 + 4)$

Fill in the chart to show what to say to count back the cash register change.

	\$5	\$1	25¢	10¢	5¢	1¢
12. \$3.42						
13. \$7.51						
14. \$1.80						

Simplify.

15. a. $5\{[(9 + 5) \div 7 + 2] \div 2\}$

b. $4\{[6 + (7 + 9) \div 8]\}$

Solve.


16. 24 is what percent of 25? _____

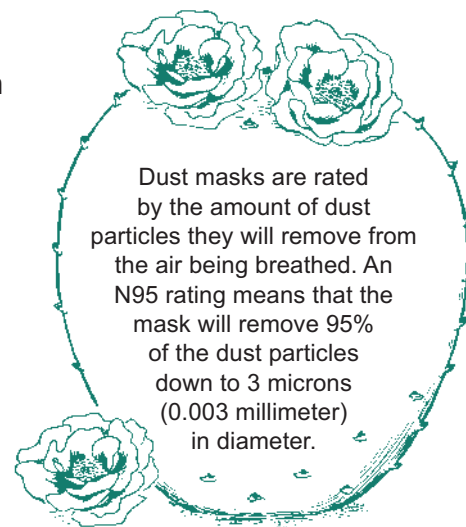
17. What is 55% of 20? _____

18. 26 is 65% of what number? _____

Mastery Drill

19. The two shorter sides of a right triangle are called _____.
20. A number factor in a term used with a variable is known as a numerical _____.
21. a. Another name for *average* is _____. b. $1 \text{ foot}^2 =$ _____ inches^2
22. a. The repeating decimal for $\frac{2}{3}$ is _____. b. The decimal for $\frac{5}{8}$ is _____.
23. a. 1 kilometer \approx _____ mile b. 1 kilogram \approx _____ pounds
24. a. 1 pint = _____ fluid ounces b. 1 gallon = _____ cubic inches

-  25. Anisa ordered dust masks for the men to use when cutting pavers and wall blocks. A box of 20 brand name filters with an N95 rating cost \$19.89. A box of 20 generic filters with the same rating cost \$14.99. How much less per filter did the generic filters cost? Round to the nearest whole cent after each division. _____



Find the percent of increase or decrease to the nearest percent.

26. A change from 85 to 55 is a decrease of _____%.
27. A change from 7 to 11 is an increase of _____%.

Use a compass and a ruler to construct a triangle with the given sides.

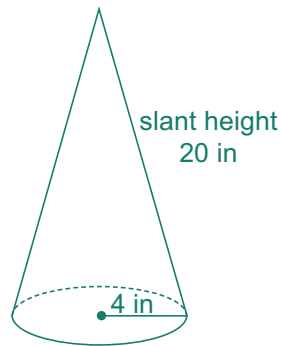
- \triangle 28. _____

Lessons 7, 8



Find the surface area of the cone. Use $\pi r l$ for the curved side surface.

29. _____



Change to standard notation.

30. $6.32 \times 10^8 =$ _____

Change to scientific notation.

31. $64,200,000 =$ _____

Lesson



Probability and Percent

It is fine to use ratios for probability. However, changing the ratios to percents often makes the probability expressions even more clear and understandable.

To tamp all the pavers firmly into place on a new walkway, Victor uses a plate tamper. Out of 1,000 pavers on a new walkway, 10 of the pavers cracked while being tamped. What is the probability that the next paver Victor tamps will crack?

The ratio probability is 10 out of 1,000.

Change the ratio to a percent: $\frac{10}{1,000} = \frac{1}{100} = 1\%$

Probability and the Flood

Probability can be a useful tool . . . as long as we don't trust it over God's word to us. Before the flood, it had never rained on the earth. If Noah had depended on man's probability calculations over God's word to him, he wouldn't have built the ark, but would have perished with the rest of the world.