

### Vocabulary

Word Bank:

<i>coefficient</i>	<i>constant</i>	<i>denominator</i>	<i>difference</i>
<i>percentage</i>	<i>like terms</i>	<i>numerator</i>	<i>product</i>
<i>slope-intercept form</i>	<i>mean</i>	<i>linear-standard form</i>	<i>quotient</i>
<i>range</i>	<i>sum</i>	<i>x-intercept</i>	<i>y-intercept</i>
<i>mode</i>	<i>median</i>	<i>probability</i>	<i>slope</i>

1. \_\_\_\_\_ the bottom number in a fraction
2. \_\_\_\_\_ an amount obtained by addition
3. \_\_\_\_\_  $y = mx + b$
4. \_\_\_\_\_  $Ax + By = C$
5. \_\_\_\_\_ mathematical average of all the terms in a data set
6. \_\_\_\_\_ an amount obtained by multiplication
7. \_\_\_\_\_ the point where a line crosses the *y-axis*
8. \_\_\_\_\_ a value or quantity at the midpoint of a data set
9. \_\_\_\_\_ an amount obtained by division
10. \_\_\_\_\_ the point where a line crosses the x-axis
11. \_\_\_\_\_ the top number in a fraction
12. \_\_\_\_\_ an amount obtained by subtraction
13. \_\_\_\_\_ the number being multiplied by a variable (the number in front of the variable)
14. \_\_\_\_\_ a term that has no variable factor (it is just a number)
15. \_\_\_\_\_ terms with exactly the same variable
16. \_\_\_\_\_ the ratio of a line's vertical change to its horizontal change
17. \_\_\_\_\_ the most frequently occurring value in a data set
18. \_\_\_\_\_ a rate, number, or amount in each hundred
19. \_\_\_\_\_ the likelihood of a given event's occurrence
20. \_\_\_\_\_ the difference between the lowest and highest values

Simplify. Leave answers in radical form (no decimals).

$$\sqrt{18}$$

$$5\sqrt{80}$$

$$3\sqrt{2} \cdot 5\sqrt{10}$$

### Solving Equations

Solve the following equations.

$$\frac{r+8}{-3} = -2$$

$$-2 + 10x = 8x - 1$$

$$3 + \frac{2}{5}y = 11 - \frac{2}{5}y$$

## Factoring Quadratic Equations

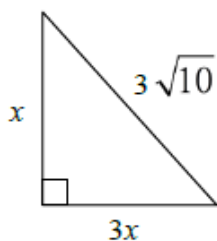
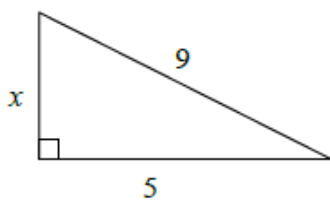
$$x^2 + 9x + 20$$

$$x^2 + 4x - 32$$

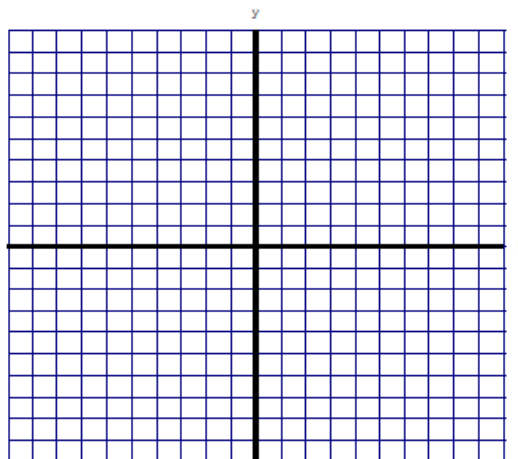
$$4x^2 - 25$$

## Pythagorean Theorem

Find the missing side length. If needed, round to the nearest tenth.



Write the equation of a line that passes through  $(-3, 2)$  and is parallel to  $x - y = 7$ . Then graph.



## Scientific Notation Word Problems

1. The particle of dust has a mass of  $7.53 \times 10^{-10}$  kilograms. Find the weight of 5 billion dust particles.
  
  
  
  
  
  
  
  
  
  
2. The distance from the sun to the Andromeda galaxy is  $1.2 \times 10^{19}$  miles. Light travels at a speed of  $5.88 \times 10^{12}$  miles per year (called a light-year). How long does it take light to travel from the sun to the Andromeda galaxy?

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3. The mass of the sun is  $1.989 \times 10^{30}$  kilograms. The mass of the earth is  $5.98 \times 10^{24}$  kilograms. How many times bigger is the sun than the earth?

4. Total health care costs in the United States in 2003 was \$1.7 trillion. The U.S. population was 290.9 million. What was the average amount spent per person on health care?

Science, Measurement, and Uncertainty: Accuracy and Precision

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

**ACCURACY AND PRECISION**

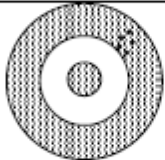
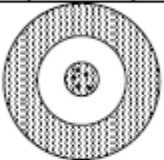
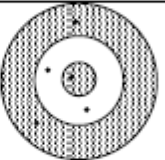
**Definitions:**

**Accuracy** - how close a measurement is to \_\_\_\_\_

**Precision** - how close a measurement is to \_\_\_\_\_

**Precision versus Accuracy:**

Look at each target and decide whether the "hits" are accurate, precise, both accurate and precise, or neither accurate nor precise: (Note: An accurate "hit" is a bulls eye!)

		
Accurate?: Yes / No Precise?: Yes / No	Accurate?: Yes / No Precise?: Yes / No	Accurate?: Yes / No Precise?: Yes / No

**Precision Problems:**

A group of students worked in separate teams to measure the length of an object. Here are their data:

Team 1	Team 2	Team 3	Team 4	Team 5	Team 6	Team 7
2.65 cm	2.75 cm	2.80 cm	2.77 cm	2.60 cm	2.65 cm	2.68 cm

- The average length is \_\_\_\_\_ cm.  
This is the mean or average.
- Subtract the highest value from the lowest value: \_\_\_\_\_ cm.  
This is the range or spread.
- Divide this number by 2: \_\_\_\_\_ cm.  
This is the approximate  $\pm$  range from the average.
- The precision of the measurement can be shown as average  $\pm$  range.  
The precision of the measurement was \_\_\_\_\_  $\pm$  \_\_\_\_\_ cm.

A second group of students obtained the following data:

Team 8	Team 9	Team 10	Team 11	Team 12	Team 13	Team 14
2.60 cm	2.70 cm	2.80 cm	2.75 cm	2.65 cm	2.62 cm	2.78 cm

- The average length is \_\_\_\_\_ cm.
- The precision of the measurement was \_\_\_\_\_ ± \_\_\_\_\_ cm.

In comparing groups, the first or the second, which group was more precise or was the precision the same? **Justify your answer.**

**Expressing Errors in Measurement:**

Scientists often express their uncertainty and error in measurement by giving a percent error. The percent error is defined as:

$$\% \text{ error} = \frac{\text{actual value} - \text{measured value}}{\text{actual value}} \times 100$$

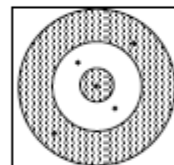
Answer the following four questions. Pay attention to significant figures, and **show your work!**

1. While doing a lab, a student found the density of a piece of pure aluminum to be 2.85 g/cm<sup>3</sup>. The accepted value for the density of aluminum is 2.70 g/cm<sup>3</sup>. What was the student's percent error?

2. A student measured the specific heat of water to be  $4.29 \text{ J/g} \cdot \text{C}^\circ$ . The literature value of the specific heat of water is  $4.18 \text{ J/g} \cdot \text{C}^\circ$ . What was the student's percent error?

3. A student took a calibrated 200.0 gram mass, weighed it on a laboratory balance, and found it read 196.5 g. What was the student's percent error?

4. Accuracy is often expressed as an average of several measurements. Look at the target to the right. In your opinion, how well do the measurements on the target represent: (Justify your opinion.)



a. Accuracy?

b. Precision?