# Teaneck Public Schools
# Incoming AMS 7th Grade Summer Math Packet

**PURPOSE:**
This math packet was created not only to offer students entering 7th grade an opportunity to practice the necessary skills needed to excel in mathematics in the upcoming school year, but also to apply these skills to real-life situations.

**PARENT/GUARDIAN RESPONSIBILITIES**
**HOW TO SUPPORT YOUR CHILD:**

- Set up a schedule with your child to break the assignment into manageable parts throughout the summer.
- Monitor your child's progress on a weekly basis.
- Encourage your child to attempt the entire packet. See Math Websites Resource Page for assistance.
- **Due date: First day of school.**

**PARENT SIGNATURE:**

_____

**STUDENT RESPONSIBILITIES:**

- Attempt to answer every question. Show all your work. Leave nothing blank.
- Do the best you can *without* a calculator.
- If you need help, ask your parent/guardian to use the Math Websites Resource Page for assistance.
- **Turn in your completed summer packet to your 7th grade math teacher on the 1st day of school.**

**GRADING:**
This summer assignment will count **as a homework grade for the first marking period of 7th grade.**

**ENJOY YOUR SUMMER!**

# Math Resource Websites

## Math is Fun

http://mathisfun.com/

Math is Fun is an excellent source for supporting the learning of middle school math; concepts, puzzles, games as well as an interactive dictionary. Math is explained in easy language, plus puzzles, games, worksheets, and a forum. For K-12 kids, teachers, parents.

## Jenny Eather's a Math Dictionary for Kids

http://www.amathsdictionaryforkids.com/

A Math Dictionary for Kids is an animated, interactive online math dictionary for students which explains over 600 common mathematical terms and math words in simple language.

## Math.com – World of Math Online

http://math.com/

Free math lessons and math homework help from basic math to algebra, geometry and beyond. Students, teacher, parents and everyone can find solutions to their math problems.

## Math Drills

http://www.math-drills.com/

An excellent source for reinforcement and drills on various topics of middle school math; includes number sense and pre-algebra drills (Includes seasonal math, flash cards and graphing paper).

## Khan Academy

https://www.khanacademy.org/

Khan Academy is a non-profit educational website created in 2006 by educator Salman Khan to provide "a free, world-class education for anyone, anywhere." The website features thousands of educational resources, including a personalized learning dashboard, over 100,000 exercise problems, and over 5,000 micro lectures via video tutorials stored on YouTube teaching mathematics, history, healthcare, medicine, finance, physics, general chemistry, biology, astronomy, economics, cosmology, organic chemistry, American civics, art history, macroeconomics, microeconomics, and computer science. All resources are available for free to anyone around the world. Khan Academy reaches about 10,000,000 students per month and has delivered over 300,000,000 lessons.

Name_____

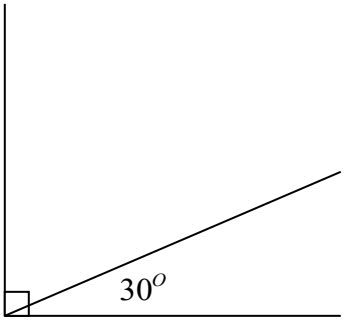
Period _____

Date _____

## Missing Measures: Complimentary and Supplementary Angles

For problems 1 – 4, find the missing angle for each problem.

1)

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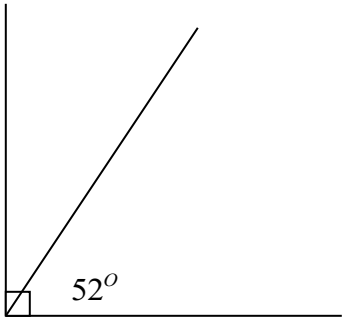


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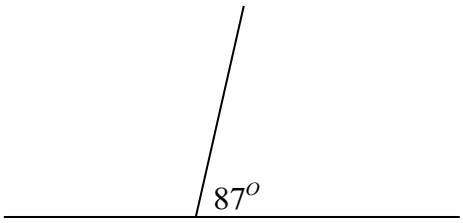


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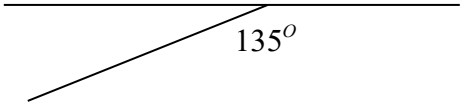



## Adding and Subtracting Integers 1: *Look at the examples for each section.*

**For problems 1 – 6, add the two negative numbers.**

***Example:*** $-6+(-12)=-18$

1. $-10+(-32)$
2. $-15+(-37)$
3. $-3+(-8)$
4. $-500+(-48)$
5. $-24+(-24)$
6. $-17+(-13)$

**For problems 7 – 12, add the positive number and the negative number.**

(Hint: Subtract and keep the sign of the larger number.)

***Example:*** $-6+(12)=6$ ***Example:*** $20+(-22)=-2$

7. $6+(-15)$
8. $25+(-15)$
9. $-10+3$
10. $-6+18$
11. $-16+4$
12. $19+(-12)$

**For problems 13 – 18, subtract the negative number from the positive number.**

***Example:*** $20-(-12)=32$

13. $11-(-2)$

14. $12-(-12)$

15. $5-(-16)$

16. $1-(-46)$

17. $4-(-19)$

18. $64-(-13)$

**For problems 19 – 24, subtract the negative number from the negative number.**

***Example:*** $-7-(-12)=-7+12=5$ ***Example:*** $-3-(-2)=-3+2=-5$

19. $-6-(-12)$

20. $-10-(-17)$

21. $-14-(-23)$

22. $-4-(-1)$

23. $-41-(-37)$

24. $-70-(-20)$

**For problems 25 – 30, subtract the positive number from the negative number.**

***Example:*** $-10-3=-13$

25. $-8-5$

26. $-26-4$

27. $-48-6$

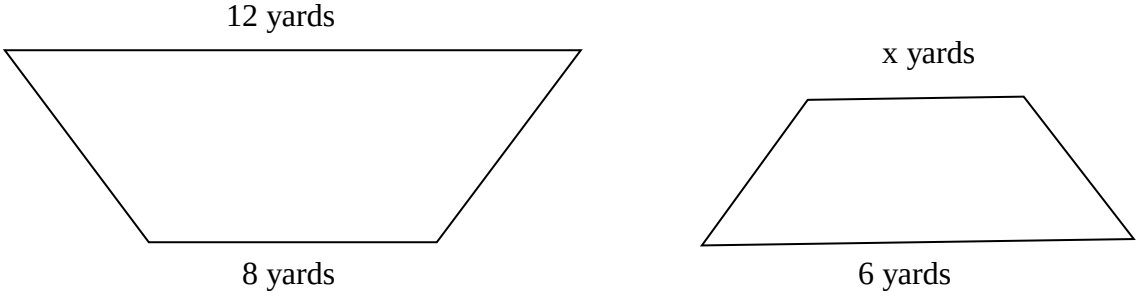
28. $-2-9$

29. $-41-6$

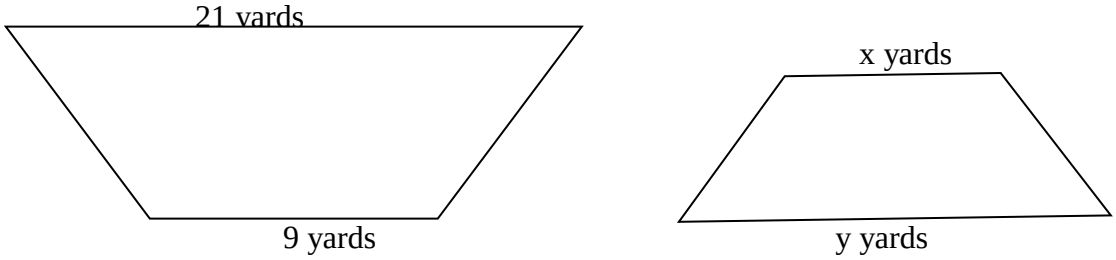
30. $-17-6$

**For problems 1 – 2, set up the proportion for each set of similar figures and solve for the missing length.**

1.




2. scale factor = $\frac{2}{3}$



## Rates and Ratios: Set up proportions to solve the following problems.

1. The ratio of goldfish to gallons of water is 7 to 2.

   a. For every _____ goldfish, there are _____ gallons of water.

   b. How many goldfish can you get if you have 16 gallons of water?

   c. How many gallons of water do you need to keep 28 fish?

2. The price of apples is 3 for $2.00.

   a. For every _____ apples, you pay _____.

   b. How much do you pay for 30 apples?

   d. How many apples can you buy for $10?

3. You are taking a test in science. There are 20 questions and 45 minutes.

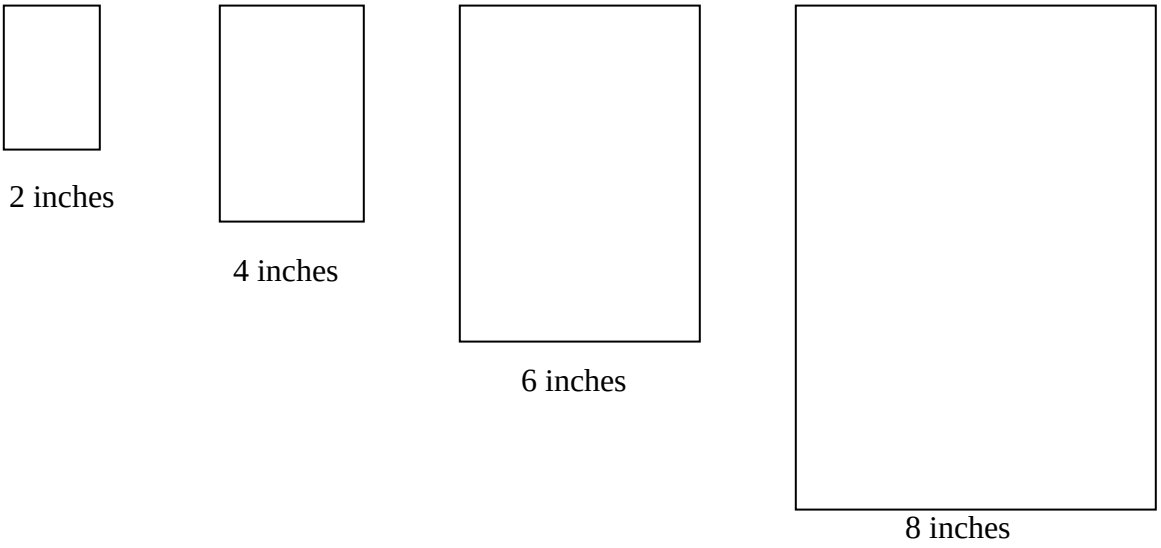
   a. For every _____ questions, you have _____ minutes.

   b. How much time do you have for 10 questions?

   c. How much time do you have for 5 questions?

   d. How much time do you have for 1 question?

4. All of the following rectangle's width to length ratio is 2 to 3. Fill in the missing lengths. (Hint: The width is the shorter side; the length is the longer side.)
   a. For every _____ inches in the width, there are _____ inches in the length.



5. The price of oranges is 4 for $3.00.

a. For every _____ oranges, you pay _____.

b. Fill in the table.

| Oranges | $ |
|---|---|
| 4 | 3 |
| 8 | |
| | |
| | |
| | |
| | |

b. How much do you pay for 24 oranges?

c. How many apples can you buy for $15?

6. For every 5 yards you run, Jill runs 6 yards.

a. If you have run 30 yards, then how far has Jill run?

b. If Jill has run 54 yards, then how far have you run?

7. 570 people die from smoking related diseases every day. (Hint: There are 365 days in a year.)

a. How many people die from smoking related diseases every hour?

b. How many people die from smoking related diseases every week?

8. You type 200 words in 5 minutes. Brenda types 240 words in 6 minutes.

   a. How many words you type in 1 minute?

   b. How many words does Brenda type in a minute?

   c. Who types the fastest?

**Solving Two-Step Equations:**
**Solve the following equations algebraically. Check your work by re-writing, replacing, and recalculating.**

1) $12 + 4v = 8$

2) $2h - 13 = 21$

3) $\frac{n}{5} - 15 = 6$

4) $34 = 6d - 8$

5) $3w - 14 = 7$

6) $\frac{f}{9} + 2 = -1$

7) 5w – 14 = 2w – 2

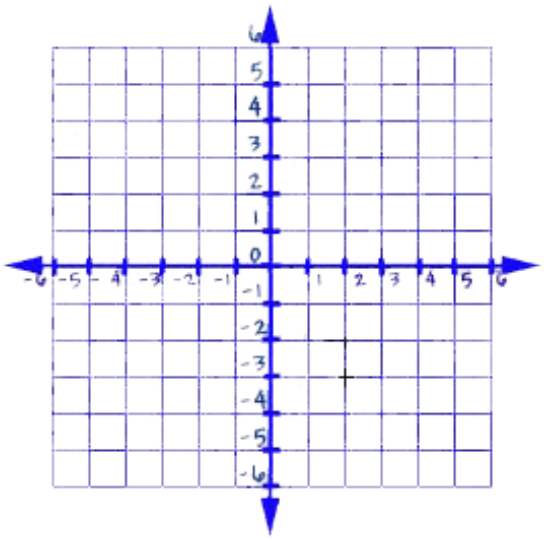
8) 3(x + 2) + 5 = x – 1\

**Tables and Linear Graphs**

**State which tables indicate a proportional relationships. If the relationship is proportional, then state the constant of proportionality.**

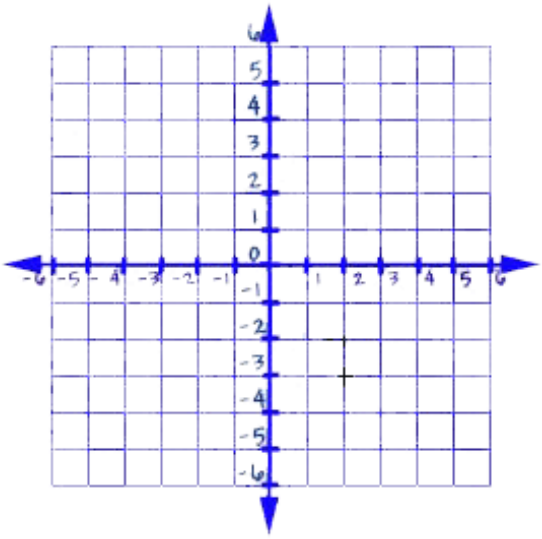
1.

| x | -2 | 0 | 2 | 4 |
|---|---|---|---|---|
| y = 3x | | | | |



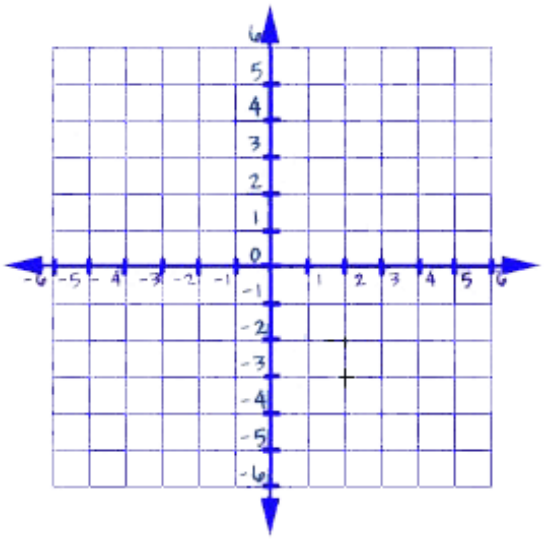
2.

| x | -2 | 0 | 2 | 4 |
|---|---|---|---|---|
| y = x + 2 | | | | |



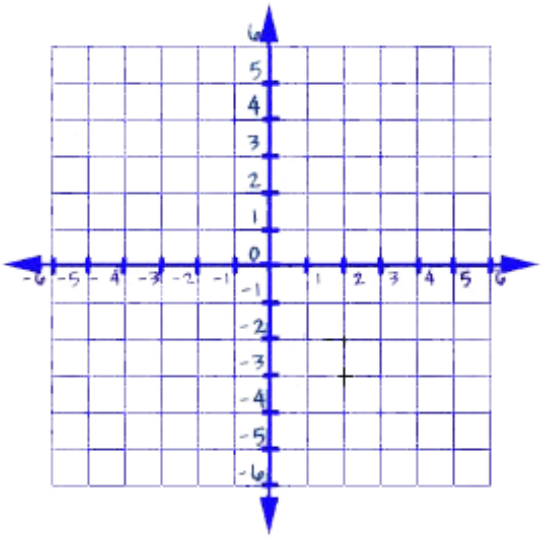
3.

| x | -2 | 0 | 2 | 4 |
|---|---|---|---|---|
| y = -2x | | | | |



4.

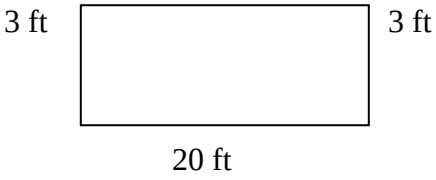
| x | -2 | 0 | 2 | 4 |
|---|---|---|---|---|
| y = 2 – x | | | | |



## Perimeter, Area, and Volume

For problems 1 – 3, find the **perimeter and area**. Make sure to include the unit of measure (ft, in, yd, cm, mm, miles, etc).

1)

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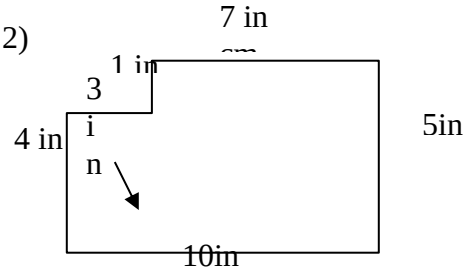


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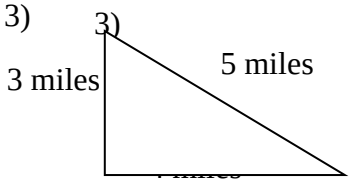
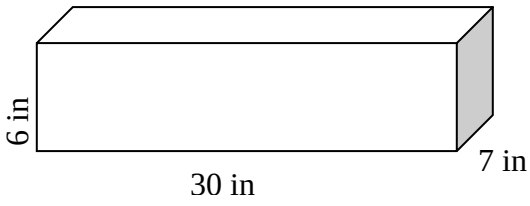


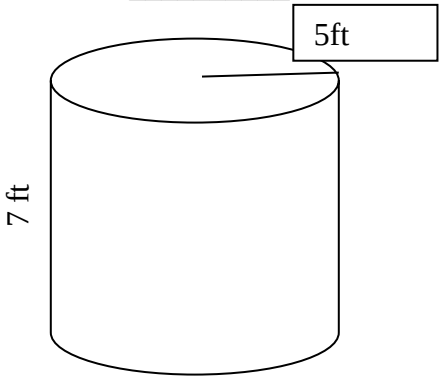

Volume of a Rectangular Prism = _____

Surface Area of a Rectangular Prism = _____

4) Volume = _____
Surface Area = _____




5) Volume = _____
Surface Area = _____




Volume of a Cylinder = _____

Surface Area of a Cylinder = _____

**Taxes, Tips, and Sales:**
**Solve the following problems. Show your methods.**

1) A store has a sale for 15 % off. You decide to buy a $45 jacket.
   a) How much money will you save?

   b) How much money will you spend on the sweater?

2) A restaurant requires customers to pay a 15% tip for the server. Your family spends $65 on the meal.
   a) How much money do you need to pay the server?

   b) How much money will you spend total?

3) Sales tax is 6% and you spend $42.
   a) How much money will you spend on tax?

   b) How much money will you spend total?

4) Sales tax is 6.5 % and you spend $58.50.
   a) How much money will you spend on tax?

   b) How much money will you spend total?

# RATIOS AND PROPORTIONS

## Ratios

A ratio is a comparison of two quantities that have the *same units*. You can express a ratio in any one of the following ways:

$\frac{18}{5}$ 18:5 18 to 5

**Example #1:** If one store has 360 items and another store has 100 of the same items, express the ratio of the items.

$\frac{360}{100}$ **or** 360:100 **or** 360 to 100

Ratios are usually written in lowest terms; therefore, the above example would reduce in this way: $\frac{360}{100} \div 20$ (What is the largest number you can divide both values by?)

$\frac{18}{5}$

**Example #2:** John earns $350 a week. His take-home pay, however, is $295. What is the ratio of his gross pay to his take-home pay.

$\frac{350}{295} = \frac{70}{59}$

## Rates

A rate is a comparison of two quantities that have *different units*. Rates are usually expressed in the fractional form.

**Example:** Francine paid $16 for her 12-month subscription to *Better Homes and Gardens* magazine. Express as a rate.

$$\frac{\$16.00}{12 \text{ magazines}} = \frac{\$4.00}{3 \text{ magazines}}$$

If Francine wants to know how much she pays for each (1) magazine, she can divide $4 by 3 magazines. This will give her the price per magazine (also called the **unit rate**).

$\frac{\$4.00}{3}$ = $1.33/magazine

## Proportions

A proportion is a statement that two ratios or rates are equal. It can be given as a sentence in words, but most often a proportion is an algebraic equation.

The arithmetic equation $\frac{3}{5} = \frac{21}{35}$ is a proportion because its cross products are equal.

$3 \times 35 = \mathbf{105}$ and $5 \times 21 = \mathbf{105}$

Proportions are solved by using this cross-product rule.

**Example #1**: $\frac{4}{9} = \frac{x}{36}$

$4 \times 36 = 9x$

$144 = 9x$

$\frac{144}{9} = x$

$16 = x$

**Example #2**: $\frac{72}{1.5} = \frac{12}{x}$

$72x = 1.5 \times 12$

$72x = 18$

$x = \frac{18}{72}$

$x = .25$ or $\frac{1}{4}$

## Applied Proportion Problems

Many problems can be solved by setting up a **direct proportion** (an increase in one quantity leads to a proportional increase in the other quantity) or by setting up **equivalent rates**.

**Example:** In one day you earn \$75 for 8 hours of work. If you work 37.5 hours for the week, what will your weekly pay be?

$\frac{8 \text{ hours}}{37.5 \text{ hours}} = \frac{\$75}{x}$

$8x = 75 \times 37.5$

$8x = 2812.5$

$x = \frac{2812.5}{8}$

$x = \$351.56$

**or**

$\frac{8 \text{ hours}}{\$75} = \frac{37.5 \text{ hours}}{x}$

$8x = 75 \times 37.5$

$8x = 2812.5$

$x = \frac{2812.5}{8}$

$x = \$351.56$

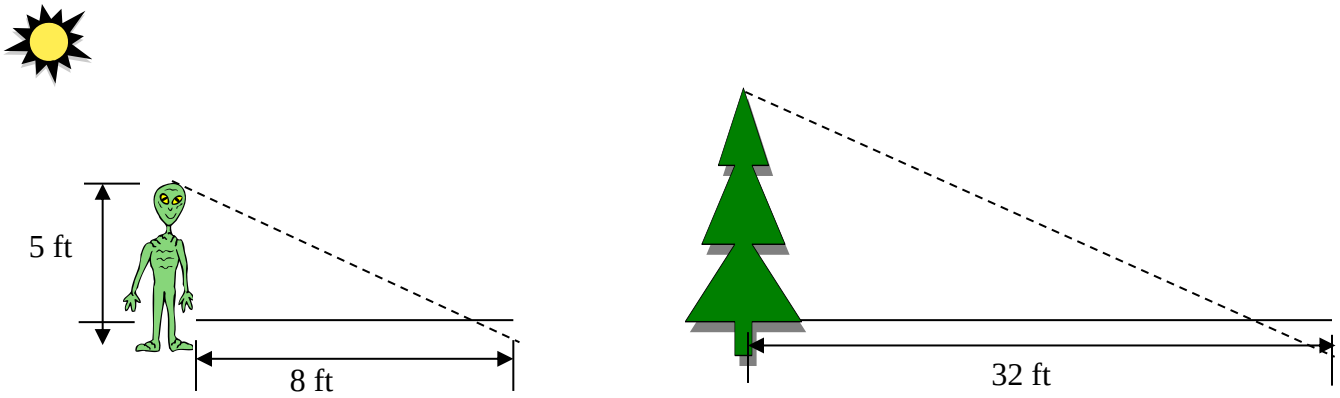
**Proportions and Equations**
**Use proportions or equations to solve the following problems**

"a is p % of b" part = percent · whole

$$\frac{a}{b} = \frac{p}{100}$$

1) 34 is 50% of what? 2) What is 12% of 130? 3) 40 is what % of 120?

4. Lance the alien is 5 feet tall. His shadow is 8 feet long.



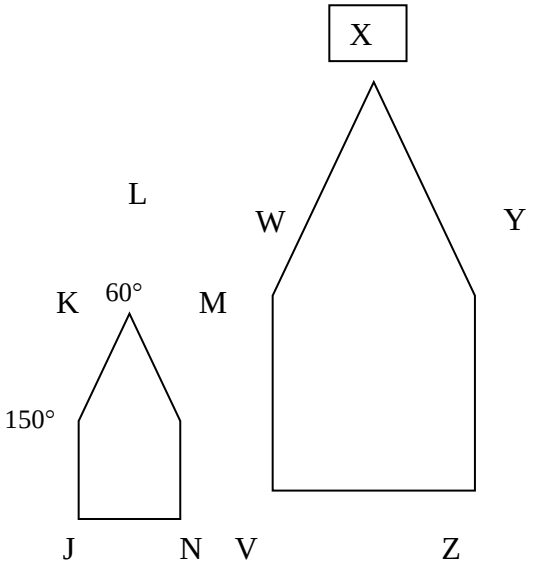

5. At the same time of day, a tree's shadow is 32 feet long. What is the height of the tree?

a) 20 feet b) 24 feet c) 29 feet d) 51 feet

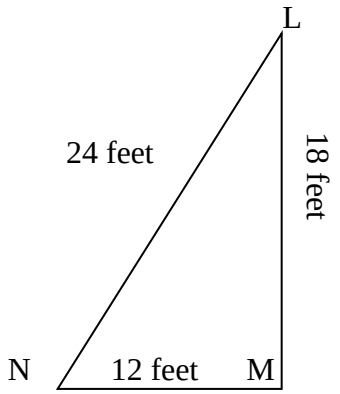
6. Pentagon JKLMN is similar to pentagon VWXYZ.

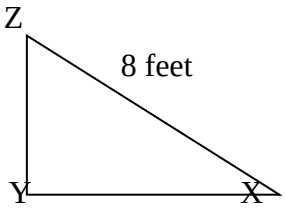
What is the measurement of angle X?

a) 30° b) 60° c) 150° d) 120°




7. Triangle LMN is similar to triangle XYZ.




What is the length of $\overline{YX}$?

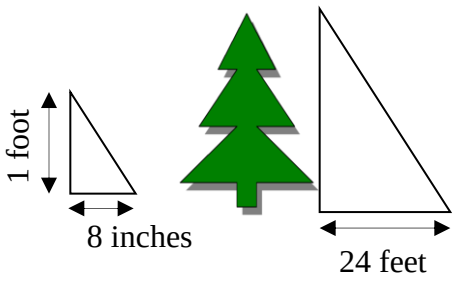
a) 2 feet b) 3 feet c) 4 feet d) 6 feet

8. A six-foot-tall person is standing next to a flagpole. The person is casting a shadow $1\frac{1}{2}$ feet in length, while the flagpole is casting a shadow 5 feet in length. How tall is the flagpole? a) 30 ft b) 25 ft c) 20 ft d) 15 ft

9. The shadow cast by a one-foot ruler is 8 inches long. At the same time, the shadow cast by a pine tree is 24 feet long.

What is the height, in feet, of the pine tree?

a) 3 feet b) 16 feet c) 36 feet d) 192 feet




## Write each ratio as a fraction in lowest terms.

1. 2 to 4

2. $\frac{15}{20}$

3. 6:18

4. 3 to 12

5. 7: 4

6. $\frac{18}{12}$

7. 35:7

8. $\frac{8}{28}$

9. 24 to 96

## Write each of the following rates as a unit rate.

1. $\frac{3 \text{ Tbsp}}{2 \text{ tsp}}$

2. $\frac{135 \text{ pitches}}{45 \text{ strikes}}$

3. $\frac{128 \text{ miles}}{4 \text{ hours}}$

4. $\frac{2250 \text{ pencils}}{18 \text{ boxes}}$

**Solve each proportion and give the answer in simplest form.**

1. $6 : 8 = n : 12$

2. $\frac{2}{7} = \frac{8}{n}$

3. $\frac{n}{6} = \frac{11}{3}$

4. $4 : n = 6 : 9$

5. $\frac{3}{n} = \frac{2}{5}$

6. $\frac{0.4}{1.5} = \frac{12}{n}$

7. $2\frac{1}{2} : 3\frac{1}{2} = n : 2$

8. $1 : 2 = n : 9$

**Solve by using a proportion. Round answers to the nearest hundredth if necessary.**

1. You jog 3.6 miles in 30 minutes. At that rate, how long will it take you to jog 4.8 miles?

2. You earn $33 in 8 hours. At that rate, how much would you earn in 5 hours?

3. An airplane flies 105 miles in ½ hour. How far can it fly in 1 ¼ hours at the same rate of speed?

4. What is the cost of six filters if eight filters cost $39.92?

5. If one gallon of paint covers 825 sq. ft., how much paint is needed to cover 2640 sq. ft.?

6. A map scale designates 1" = 50 miles. If the distance between two towns on the map is 2.75 inches, how many miles must you drive to go from the first town to the second?

7. Bob is taking his son to look at colleges. The first college they plan to visit is 150 miles from their home. In the first hour they drive at a rate of 60 mph. If they want to reach their destination in 2 ½ hours, what speed must they average for the remainder of their trip?

8. Four employees can wash 20 service vehicles in 5 hours. How long would it take 5 employees to wash the same number of vehicles?

**PROBABILITY**

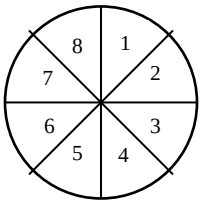
**There are 5 red marbles, 7 green marbles, 4 black marbles, and 8 blue marbles in a bag. Suppose you select one marble at random. Find each probability.**

1. P(red)
2. P(not green)
3. P(green or black)

**A dice is rolled. Find each probability.**

4. P(odd)
5. P(greater than 6)

**Determine the probability of spinning each outcome using the spinner below.**




6. P(a four)
7. P(a one)
8. P(an even number)
9. P(2 or a 4)
10. P(not a 3)
11. P(less than 6)

**Directions:** Solve the following problems by finding the mean, median, range, or mean absolute deviation (MAD). You may use a calculator, but you must **show your work!**

1. {6, 1, 3, 8, 5, 11, 1, 5}

Mean = _____

MAD = _____

Range = _____

2. Jason and Jill are two students in Mr. White's math class. On the last five quizzes, Jason scored an 80, 90, 95, 85, and 70. Jill scored a 70, 75, 90, 100, and 95. Find the mean and mean absolute deviation for each student.

Jason's Mean = _____ Jill's Mean = _____

Jason's MAD = _____ Jill's MAD = _____

Who has a better quiz average? _____

Who has more consistent grades? _____