Solving Proportions Worksheet

Name: _____
Date: _____ Section: _____

Each problem could be set up this way:

1. Write the proportion. $\quad\quad\quad\quad$ $\dfrac{8}{3} = \dfrac{192}{n}$

2. Write the cross products $\quad\quad$ $8 \cdot n = 192 \cdot 3$
3. Multiply $\quad\quad\quad\quad\quad\quad\quad$ $8n = 576$
4. Undo multiplication by using $\quad$ $\dfrac{8n}{8} = \dfrac{576}{8}$
   division
5. Divide $\quad\quad\quad\quad\quad\quad\quad$ $n = 72$

**Solve each proportion. Be sure to set it up the correct way and show all work.**

1. $\dfrac{4}{9} = \dfrac{10}{x}$

2. $\dfrac{5}{2} = \dfrac{x}{6}$

3. $\dfrac{5}{2} = \dfrac{2}{x}$

4. $\dfrac{21}{27} = \dfrac{x}{18}$

5. $\dfrac{15}{21} = \dfrac{20}{y}$

6. $\dfrac{b}{26} = \dfrac{39}{9}$

7. $\dfrac{h}{108} = 0.435$

8. $4.56 = \dfrac{70}{w}$

9. $0.65 = \dfrac{j}{15}$

10. $\dfrac{350}{p} = 0.25$

11. $\dfrac{g}{1134} = 0.95$

12. $1.75 = \dfrac{z}{104}$

The Right Triangle Trigonometric Ratios – Although we won't prove this fact until a future geometry course, all right triangles that have a common acute angle are similar. Thus, the ratios of their corresponding sides are equal. A very long time ago, these ratios were given names. These trigonometric ratios (trig ratios) will be introduced through the following exercises, each of which refer to the diagram below.
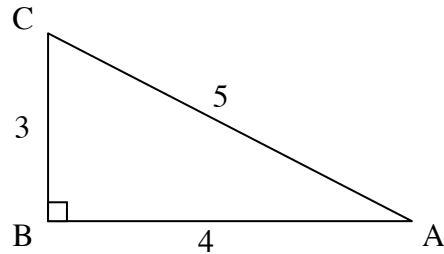
In a right triangle:

$$\text{tangent of an angle} \; = \; \frac{\text{leg opposite of the angle}}{\text{leg adjacent to the angle}}$$

***Exercise #3:*** $\tan A = \qquad \tan C =$

$$\text{sine of an angle} \; = \; \frac{\text{leg opposite of the angle}}{\text{hypotenuse}}$$

***Exercise #4:*** $\sin A = \qquad \sin C =$

$$\text{cosine of an angle} \; = \; \frac{\text{leg adjacent to the angle}}{\text{hypotenuse}}$$

***Exercise #5:*** $\cos A = \qquad \cos C =$

A Helpful Mnemonic For Remembering the Ratios:

# SOH-CAH-TOA

**S**ine is **O**pposite over **H**ypotenuse – **C**osine is **A**djacent over **H**ypotenuse – **T**angent is **O**pposite over **A**djacent

***Exercise #3:*** Find each of the following ratios for the right triangle shown below.
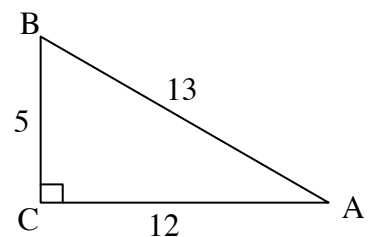
(a) $\sin A =$    (b) $\tan B =$
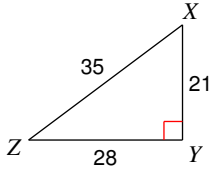
(c) $\cos A =$    (d) $\tan A =$
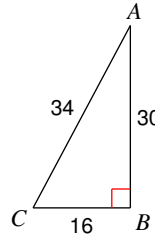
(e) $\cos B =$    (f) $\sin B =$

Name_____

# Trigonometric Ratios

Date_____ Period____

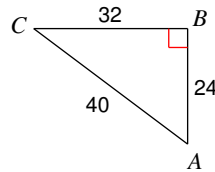**Find the value of each trigonometric ratio.**

1) tan *Z*



2) cos *C*



3) sin *C*



4) tan *X*



5) cos *A*



6) sin *A*



7) sin *Z*



8) sin *C*



9) cos *Z*



10) tan *C*
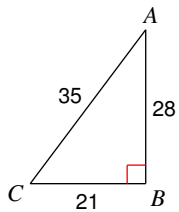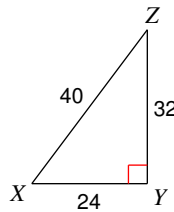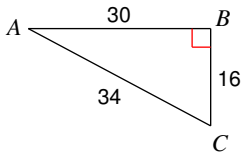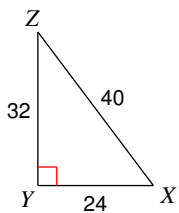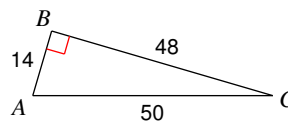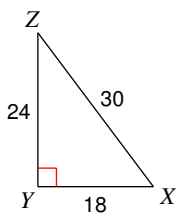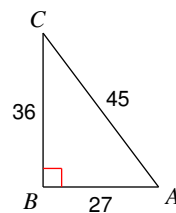
Name_____

# Solving Right Triangles

Date_____ Period____

**Find the missing side. Round to the nearest tenth.**

1)



2)



3)



4)



5)



6)



7)



8)
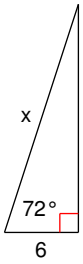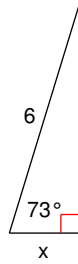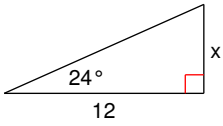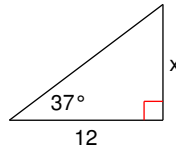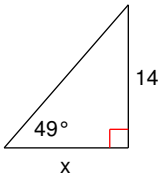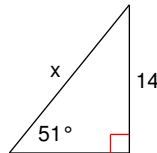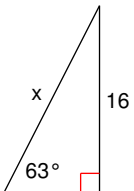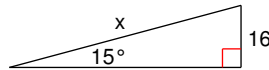
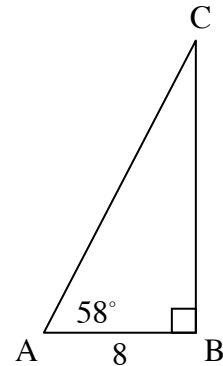## Using Trigonometry to Solve for Missing Sides
## Algebra 1 Homework

## Skill

In problems 1 through 3, determine the trigonometric ratio needed to solve for the missing side and then use this ratio to find the missing side.

1. In right triangle $ABC$, $m\angle A = 58°$ and $AB = 8$. Find the length of each of the following. Round your answers to the nearest *tenth*.
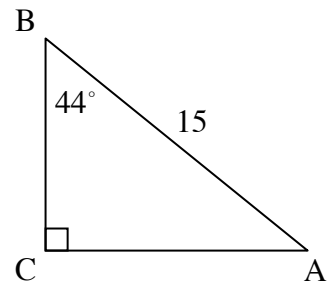
(a) $BC$

(b) $AC$



2. In right triangle $ABC$, $m\angle B = 44°$ and $AB = 15$. Find the length of each of the following. Round your answers to the nearest *tenth*.
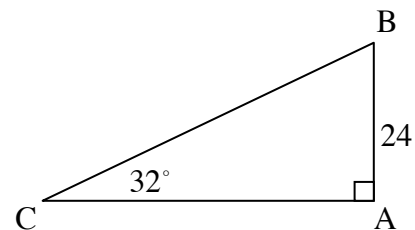
(a) $AC$

(b) $BC$



3. In right triangle $ABC$, $m\angle C = 32°$ and $AB = 24$. Find the length of each of the following. Round your answers to the nearest *tenth*.
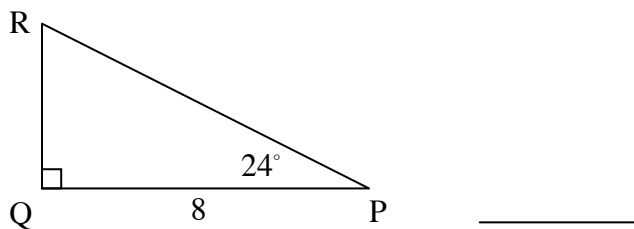
(a) $AC$

(b) $BC$

4. Which of the following would give the length of hypotenuse $\overline{PR}$ in the diagram below?

(1) $8\cos(24°)$

(3) $8\tan(24°)$

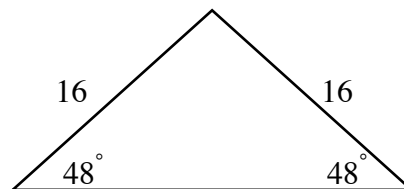(2) $\dfrac{8}{\cos(24°)}$

(4) $\dfrac{8}{\tan(24°)}$

R

24°

Q          8          P

_____

## Applications

5. An isosceles triangle has legs of length 16 and base angles that measure $48°$. Find the height of the isosceles triangle to the *nearest tenth*. Hint – Create a right triangle by drawing the height.

16                16

48°              48°

6. Carlos walked 10 miles at an angle of $20°$ north of due east. To the nearest tenth of a mile, how far east, $x$, is Carlos from his starting point?

N

10 miles

20°

E

$x$
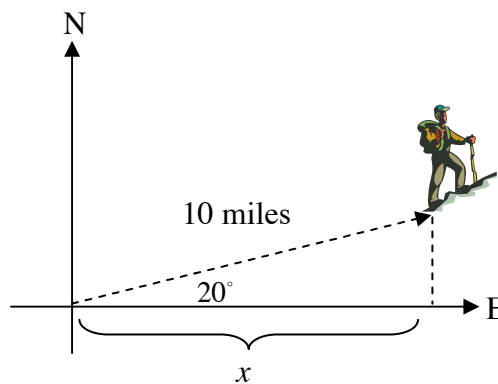
7. Students are trying to determine the height of the flagpole at Arlington High. They have measured out a horizontal distance of 40 feet from the flagpole and site the top of it at an angle of elevation of $52°$. What is the height, $h$, of the flagpole? Round your answer to the nearest *tenth* of a foot.

$h$

52°

40 ft