More on Trigonometric Ratios … Set 2

Solving Proportions Worksheet

Each problem could be set up this way:

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

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

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

<u>The Right Triangle Trigonometric Ratios</u> – 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.
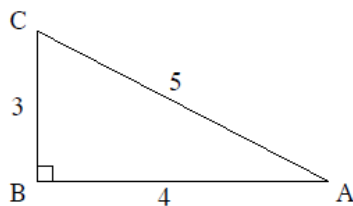
In a right triangle:

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

Exercise #3: tan A =   tan C =

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

Exercise #4: sin A =   sin C =

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

Exercise #5: cos A =   cos C =

<u>A Helpful Mnemonic For Remembering the Ratios:</u>

SOH-CAH-TOA

Sine is **O**pposite over **H**ypotenuse – Cosine is **A**djacent over **H**ypotenuse – Tangent 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 =

Similar Right Triangles - Introduction to Trigonometry
Algebra 1 Homework

Skills

For problems 1 – 6, use the triangle to the right to find the given trigonometric ratios.
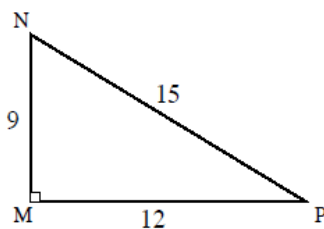
1. $\cos N =$

2. $\sin N =$

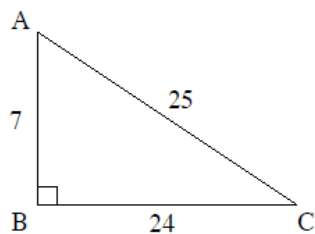3. $\tan N =$

4. $\sin P =$

5. $\cos P =$

6. $\tan P =$

7. Given the right triangle shown, which of the following represents the value of $\tan A$?

   (1) $\dfrac{25}{24}$ (3) $\dfrac{7}{24}$
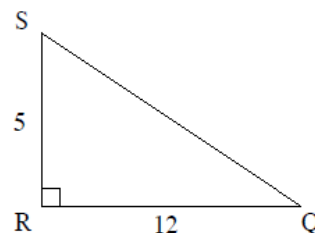
   (2) $\dfrac{24}{7}$ (4) $\dfrac{24}{25}$

                                                _____

8. In the right triangle below, $\cos Q = ?$

   (1) $\dfrac{12}{5}$ (3) $\dfrac{12}{17}$

   (2) $\dfrac{5}{12}$ (4) $\dfrac{12}{13}$

                                                _____

Trigonometric Ratios

Find the value of each trigonometric ratio.

1) $\tan Z$
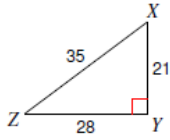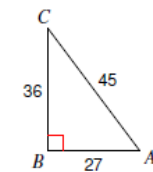
2) $\cos C$
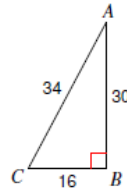
3) $\sin C$
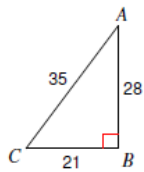
4) $\tan X$
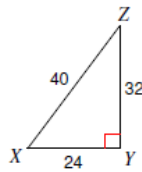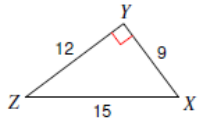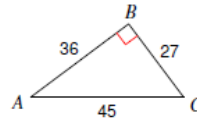
5) $\cos A$
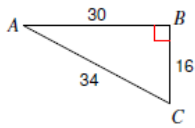
6) $\sin A$

7) $\sin Z$

8) $\sin C$

9) $\cos Z$

10) $\tan C$

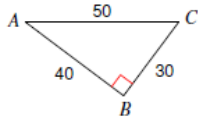4
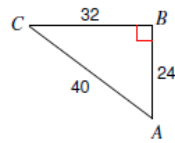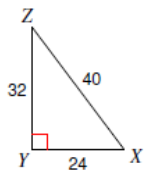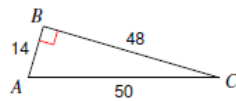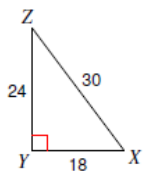
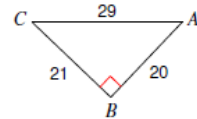**Find the value of each trigonometric ratio to the nearest ten-thousandth.**
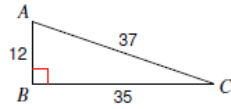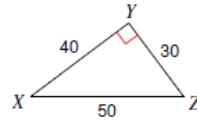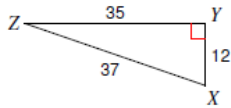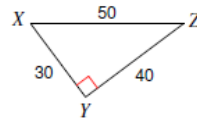
11) $\cos Z$

12) $\cos C$

13) $\tan C$

14) $\tan A$

15) $\tan C$

16) $\tan X$

17) $\sin Z$

18) $\sin Z$

19) $\sin 48°$

20) $\sin 38°$

21) $\cos 61°$

22) $\cos 51°$

Critical thinking questions:

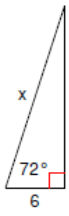23) Can the sine of an angle ever equal 2? Why or why not?

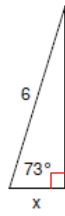24) $\sin x = \dfrac{1}{3}$

Find $\cos x$.

Find the missing side. Round to the nearest tenth.

1)

x

72°

6

2)

6

73°

x

3)
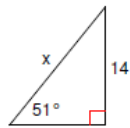
24°

12

x

4)

37°

12

x

5)

14

49°

x

6)

x

14

51°

7)

x

16

63°

8)

x

15°

16

9)

29

x

55°

10)

x

21

68°

11)

x

29

19°

12)

x

21°

22

13)

29

33°

x

14)

35

45°

x

15)

47° x

28

16)

34

59°

x
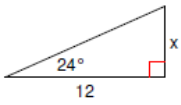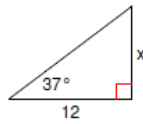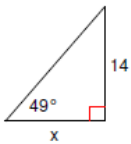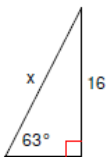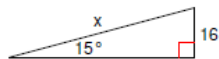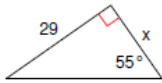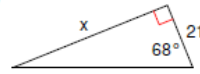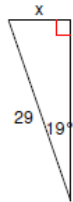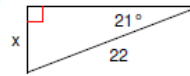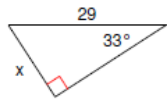
Critical thinking question:

17) Write a new problem that is similar to the others on this worksheet. Solve the question you wrote.

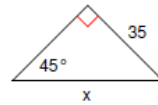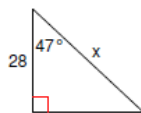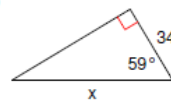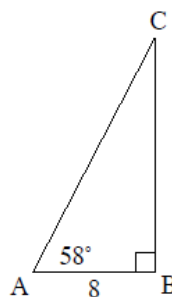## Using Trigonometry to Solve for Missing Sides
Algebra 1 Homework

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*.
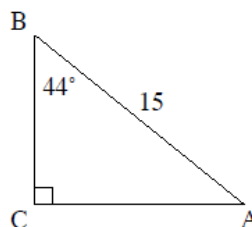
(a) BC

(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*.
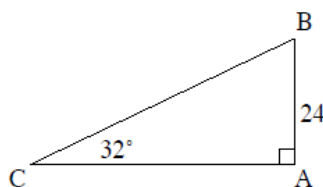
(a) AC

(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*.
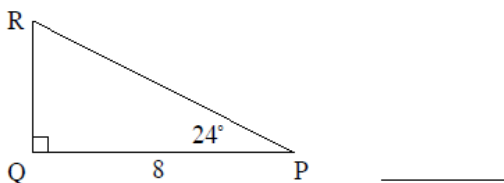
(a) AC

(b) BC

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

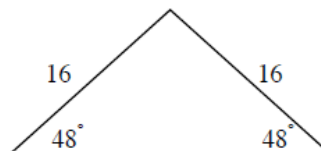(1) $8\cos(24°)$

(3) $8\tan(24°)$
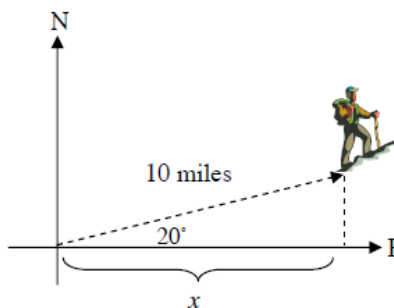
(2) $\dfrac{8}{\cos(24°)}$

(4) $\dfrac{8}{\tan(24°)}$

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.

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?

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.