Introduction to Trigonometry

**CORE STANDARDS**

HSG.SRT.C.6

HSG.SRT.C.7

LESSON

**5-4**

OBJECTIVE **1. SWBAT define and apply trig ratios and the Pythagorean Theorem to solve problems.**

Trigonometric Ratio Definitions

In a right triangle with acute angle *θ,*







NOTES

The Pythagorean Theorem

In a right triangle, with leg measures *a* and *b*, and hypotenuse *c*,



*hyp*

*opp*

*adj*

*θ*

*c*

*a*

*b*

Trig Ratios and Complementary Angles

If *A* + *B* = 90, (such as the two acute angles in a right triangle), then…

  

EXAMPLES

**1.** The legs of a triangle measure 5cm and 12cm. **2.** Fill in each blank:

What is the length of the hypotenuse? sin 76 = cos \_\_\_\_\_

If sin 55 = 0.819, then cos 35 = \_\_\_\_\_

If tan 42 = 0.9, then tan 48 = \_\_\_\_\_

If sin *A* = , then tan *A* = \_\_\_\_\_

**3.** Use the figure to write the values of the six trig ratios at the right.

*C*

*B*

*A*

sin *A* = sin *B* =

17 cm

cos *A* = cos *B* =

tan *A* = tan *B* =

8 cm

**4.** Use the figure to write the values of the six trig ratios at the right. Express answers in exact form.

*C*

*B*

*A*

sin *A* = sin *B* =

5 cm

cos *A* = cos *B* =

tan *A* = tan *B* =

7 cm

PRACTICE **5-4** NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[SHOW YOUR WORK]

Find the length of the third side of a right triangle where *a* and *b* are lengths of legs and *c* is the length of the hypotenuse. Express your answer as a simplified radical when necessary.

1. *a* = 3cm, *b* = 4cm, *c* = ? 2. *a* = 24in, *c* = 25in, *b* = ?
2. *b* = 20m, *c* = 28m, *a* = ? 4. *a* = 8mm, *b* = 9mm, *c* = ?

1. Use the figure to write the values of the six trig ratios at the right.

sin *A* = sin *B* =

*C*

*B*

*A*

8 cm

10 cm

cos *A* = cos *B* =

tan *A* = tan *B* =

1. Use the figure to write the values of the six trig ratios at the right. Express your answer as a simplified radical when necessary.

*C*

*B*

*A*

sin *A* = sin *B* =

22 cm

10 cm

cos *A* = cos *B* =

tan *A* = tan *B* =

Fill in the blanks so that the following statements are true. Assume all angles are acute. (0 < *θ* < 90)

1. If sin *A* = cos *B*, then *A* + *B* = \_\_\_\_\_ 8. 
2. If , and *A* + *B* = 90, then tan *B* =\_\_\_\_\_ 10. If , then sin *A* = \_\_\_\_\_
3. If , then sin *B* = \_\_\_\_\_ 12. If , cos *A* = \_\_\_\_\_
4. Use properties of similarity and the Pythagorean Theorem to find the missing side lengths.

*a*

*b*

3

12

35

Then show numerically that:

sin *a* = sin *b* and cos *a* = cos *b*

*x* + 6

*x* – 3

*x* – 2

*A*

1. Solve for *x*.

Then find tan *A*.