MGSE9-12.G.SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
MGSE9-12.G.SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.

Find the exact value of the three trig functions for the triangle below.
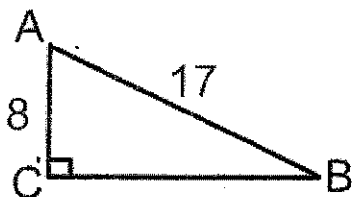

sin θ =   cos θ =   tan θ =

Sketch the triangle and find the other 2 trig functions of the <u>acute</u> angle.

1. $\cos θ = \dfrac{3}{4}$ 2. $\tan θ = 6$

Find the cosine and sine of the acute angles in the triangle shown.

The trigonometric function of the complement of an angle is called a _____. Sine and cosine are cofunctions of each other.

1. Write sin 58° in terms of the cosine.   _____

2. Write cos 24° in terms of the sine. _____
Write each trigonometric function in terms of its cofunction.

1. sin 78° = _____   2. cos 31° = _____

Using the Calculator
**You must always remember to check your calculator. It needs to be in _____mode in order to calculate the answers correctly.

Let's make sure you can use your calculator. Round your answers to two decimal places.
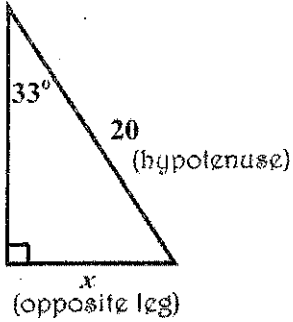
sin 48°   tan 22°   cos 52°

How would you solve these equations?
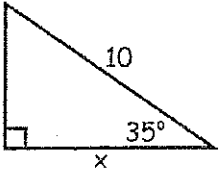
$$\sin 20° = \frac{a}{12} \qquad\qquad\qquad \cos 80° = \frac{25}{b}$$

When given an acute angle measure and a side length, we can use trig to find another side length of the triangle.
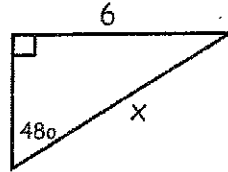

33°

20
(hypotenuse)

x
(opposite leg)

Which trig ratio contains "hypotenuse" and "opposite leg"?

Write an equation that would allow us to solve for x. Then, solve for x.

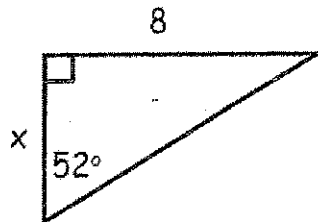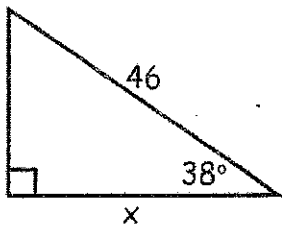Let's try another one.
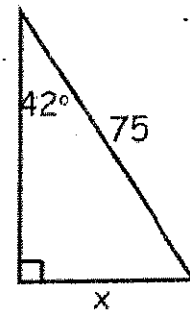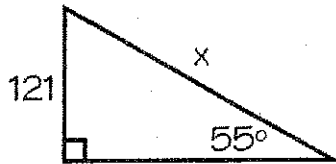

10

35°

x

One More. . .

6

x

48°

Work with your neighbor on these problems.

39°

65

x

121

x

55°

42°

75

x

46

38°

x

8

x

52°

Find x and y.

5

x

32°

y
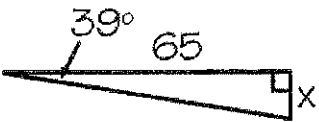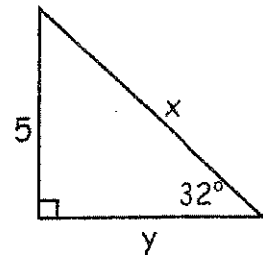
Geometry   Date_____
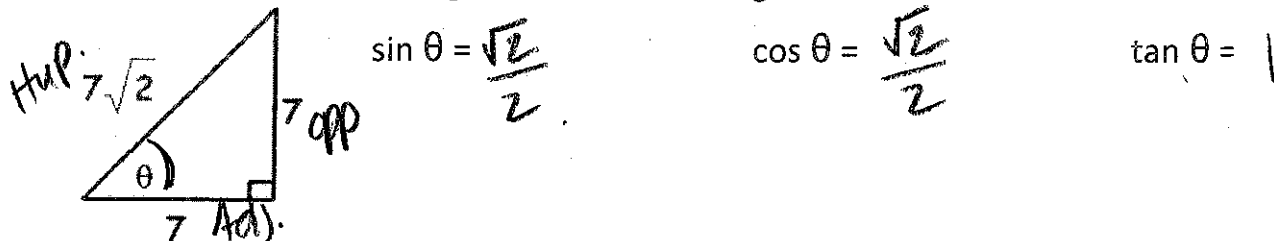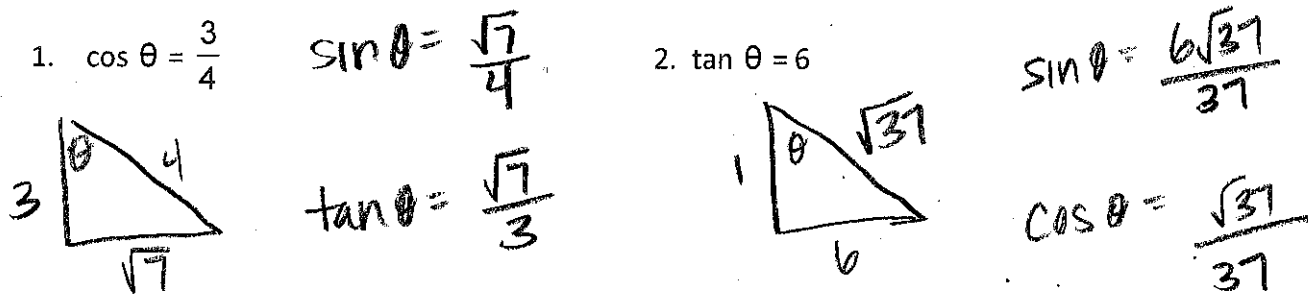
Guided Notes – Trigonometric Ratios (Day 2)

> MGSE9-12.G.SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
> MGSE9-12.G.SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.
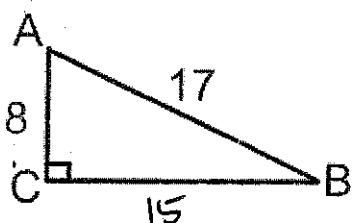
Find the exact value of the three trig functions for the triangle below.

$\text{Hyp } 7\sqrt{2}$ 7 opp θ 7 Adj

$\sin \theta = \dfrac{\sqrt{2}}{2}$ $\cos \theta = \dfrac{\sqrt{2}}{2}$ $\tan \theta = 1$

Sketch the triangle and find the other 2 trig functions of the <u>acute</u> angle.

1. $\cos \theta = \dfrac{3}{4}$ $\sin \theta = \dfrac{\sqrt{7}}{4}$

$3 \quad \theta \quad 4 \quad \sqrt{7}$

$\tan \theta = \dfrac{\sqrt{7}}{3}$

2. $\tan \theta = 6$ $\sin \theta = \dfrac{6\sqrt{37}}{37}$

$1 \quad \theta \quad \sqrt{37} \quad 6$

$\cos \theta = \dfrac{\sqrt{37}}{37}$

Find the cosine and sine of the acute angles in the triangle shown.

A   17   8   C   B   15

$\sin A = 15/17 \quad \cos A = 8/17$

$\sin B = 8/17 \quad \cos B = 15/17$

The trigonometric function of the complement of an angle is called a <u>cofunction</u>. Sine and cosine are cofunctions of each other.

1. Write sin 58° in terms of the cosine.   <u>$\cos 32°$</u>

2. Write cos 24° in terms of the sine. <u>$\sin 66°$</u>

Write each trigonometric function in terms of its cofunction.

1. sin 78° = <u>$\cos 12°$</u>   2. cos 31° = <u>$\sin 59°$</u>

Using the Calculator

**You must always remember to check your calculator. It needs to be in <u>degree</u> mode in order to calculate the answers correctly.

Let's make sure you can use your calculator. Round your answers to two decimal places.

sin 48°   tan 22°   cos 52°

| .74 | | .40 | | .62 |

How would you solve these equations?

$$\sin 20° = \frac{a}{12}$$

$$12 \sin 20° = a$$

$$\boxed{a = 4.1}$$

$$\cos 80° = \frac{25}{b}$$

$$\frac{25}{\cos(80)} = \frac{\cos(80) \cdot b}{\cos(80)}$$

$$\boxed{b = 143.97}$$

When given an acute angle measure and a side length, we can use trig to find another side length of the triangle.
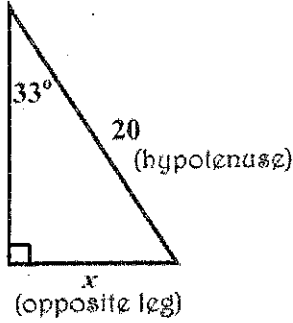
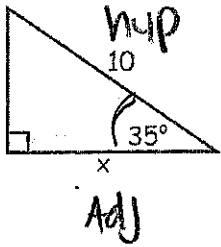Which trig ratio contains "hypotenuse" and "opposite leg"?

SIN

Write an equation that would allow us to solve for x. Then, solve for x.

$$\sin(33°) = \frac{x}{20}$$

$$20 \sin(33) = x$$
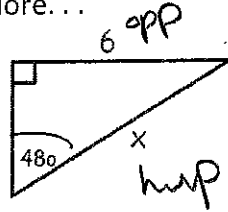
$$\boxed{x \approx 10.89}$$

Let's try another one.

$$\cos(35) = \frac{x}{10}$$

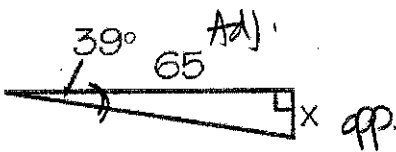$$10 \cos(35) = x$$

$$\boxed{x \approx 8.19}$$

One More...

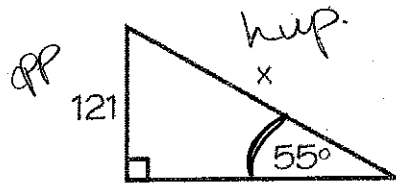$$\sin(48) = \frac{6}{x}$$

$$x = \frac{6}{\sin(48)}$$

$$\boxed{x \approx 8.07}$$
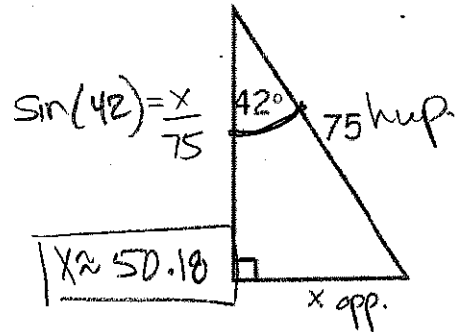
Work with your neighbor on these problems.

$$\tan(35) = \frac{x}{65}$$

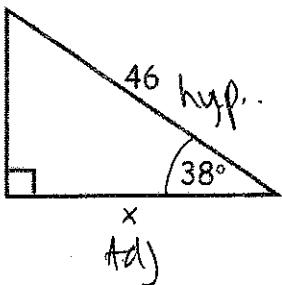$$\boxed{x \approx 52.64}$$

$$\sin(55) = \frac{121}{x}$$

$$\boxed{x \approx 147.71}$$

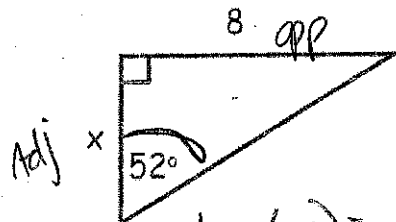
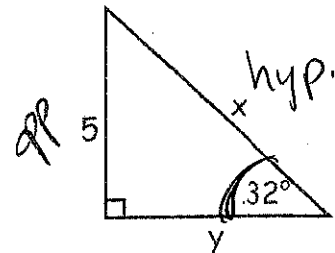$$\sin(42) = \frac{x}{75}$$

$$\boxed{x \approx 50.18}$$

Find x and y.

$$\cos(38) = \frac{x}{46}$$

$$\boxed{x \approx 36.25}$$

$$\tan(52) = \frac{8}{x}$$

$$\boxed{x \approx 6.25}$$

$$\sin(32) = \frac{5}{x}$$

$$\boxed{x \approx 9.44}$$

$$\tan(32) = \frac{5}{y}$$

$$\boxed{y \approx 8}$$