Level 2

Make sure your calculator is in DEGREE mode!!!!!

Example: Calculate the value of sin 53

Once you have determined your calculator is in Degree mode, depending on how your calculator is programmed, you do one of the two following sequence of keystrokes. This works no matter whether you are finding sin 53, cos 53 or tan 53, you just change the trig ratio button that you select.

Possible keystroke sequence #1:   Possible keystroke sequence #2:

| sin | 5 | 3 | = | | 5 | 3 | sin |

The correct answer is 0.7986 to four decimal places.

Practice: Calculate the value of the following:

   a)   Sin 48   b)   sin 70   c)   cos 42   d)   cos 81

   e)   tan 50   f)   tan 73   g)   cos 12   h)   tan 23

Example: Calculate X in tan X = 0.35

Once you have determined your calculator is in degree mode, depending on how your calculator is programmed, you do one of the two following sequence of keystrokes. This works no matter whether you are finding sin X = 0.35 or cos X = 0.35 or tan X = 0.35, you just change the trig ratio button that you select.

Possible keystroke sequence #1   Possible keystroke sequence #2

| 2nd (or shift) | tan | . | 3 | 5 | = | | . | 3 | 5 | 2nd (or shift) | tan |

The correct answer is 19.3°
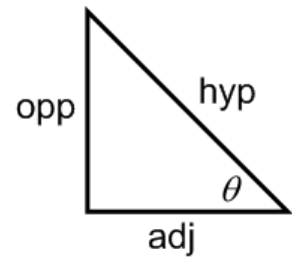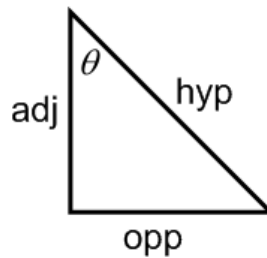
Practice: Calculate X in the following

   a)   Sin X = 0.72   b)   sin X = 0.27   c)   cos X = 0.54

   d)   cos X = 0.85   e)   tan X = 0.15   f)   tan X = 0.67

The three trig ratios are: $sin\theta = \frac{opp}{hyp}$ $cos\theta = \frac{adj}{hyp}$ $tan\theta = \frac{opp}{adj}$

The hypotenuse is always the side across from
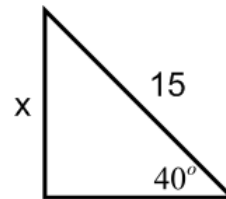The right angle.

The opposite side depends upon which angle
You are looking for. The side across from the
Angle you are given or looking for is the
Opposite side.

The adjacent side depends upon which angle you are looking for. The side next to the angle you are given or
looking for, that is not the hypotenuse is the adjacent angle.

Example: Use the sine ratio to find x

The angle $\theta = 40$. The hypotenuse is 15 and the
opposite side to $40°$ is x.
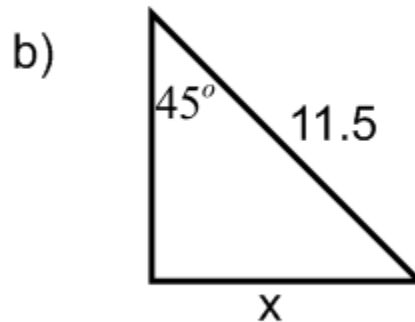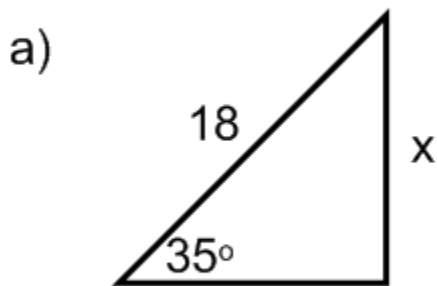
$sin\theta = \frac{opp}{hyp}$

$sin40 = \frac{x}{15}$ Determine sin 40 using keystrokes from first example above

$0.642788 = \frac{x}{15}$

$(0.642788)(15) = x$ Solve for x so multiply 15 to 0.642788

$9.64 = x$

Practice: Use the sine ratio to find x

a)

18

X

35°

b)

45°

11.5

X

Example: Use the cos ratio to find x.

The angle $\theta = 35$. The hypotenuse is 13 and the
adjacent side to 35° is x.

$$cos\theta = \frac{adj}{hyp}$$
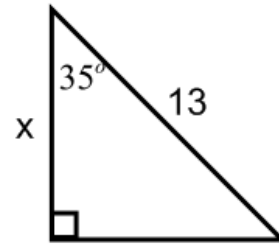
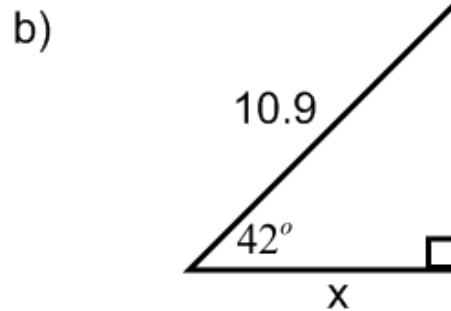$cos35 = \frac{x}{13}$ Determine cos 35 using keystrokes from first example above
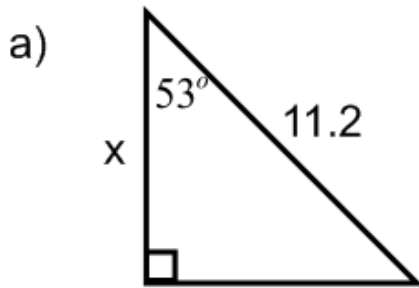
$0.819152044 = \frac{x}{13}$

$(0.819152044)(13) = x$ Solve for x so multiply 13 to 0.819152044

$10.65 = x$

Practice:
Use the cos ratio to find x in each of the following:

a)

b)

Example: Using the following triangle, find the measures of AC, <A, and <C.

Since this is a right triangle and we know two of the sides, we can use
The Pythagorean theorem to find the third side. In this case, the missing
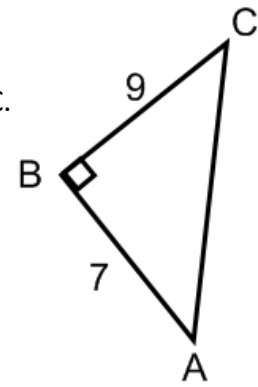Side is the hypotenuse, so it goes into the c spot in the formula

$a^2 + b^2 = c^2$
$9^2 + 7^2 = c^2$
$81 + 49 = c^2$
$130 = c^2$
$11.4 = c$
Therefore, AC = 11.4

To determine <A, we look at which sides we know. The opposite side to <A is 9, the adjacent side to <A is 7.
The formula that uses opposite and adjacent is tan.

$tan\theta = \dfrac{opp}{adj}$

$tanA = \dfrac{9}{7}$

$tanA = 1.285714286$

A = 52^0

Since we now know one of the angles, we can find the other one by using the triangle sum property: all angles
add to 180^0.
We know the right angle measures 90^0 and <A = 52^0 so we can find <A by doing $180 - 90 - 52 = 38^0$.

There are other ways and orders we could have solved for the missing sides!!!!

**Practice:**   In each of the following, determine AC, <A and <C.

a)

b)
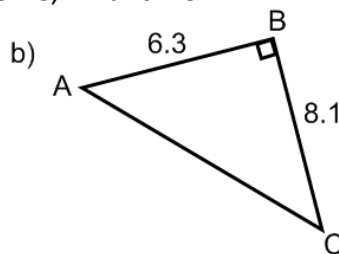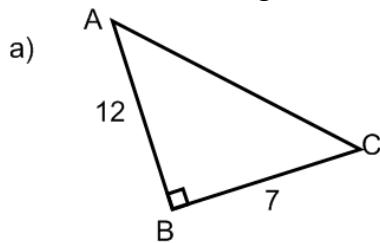
Level 4

Example: Determine <ACB

This might look confusing, but if you look at it closely, the
Large triangle ABC is a right triangle, and you know the measures
Of two of the sides. AB = 12 and AC = 4 + 5 = 9.   If we are trying to find <ACB,
You are looking for the angle at C.   The side with length 12 is opposite this angle.
The side with length 9 is adjacent to this angle. The ratio that uses opposite and adjacent is tan.

$$tan\theta = \frac{opp}{adj}$$

$$tanC = \frac{12}{9}$$
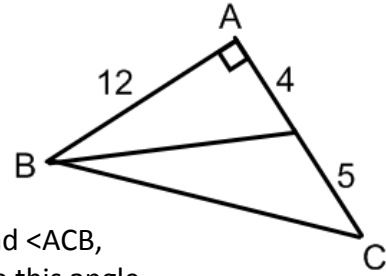
$$tanC = 1.333333$$

$$C = 53^{\circ}$$

Practice: Determine <ACB

a)

b)