

What's Going On?

Checking In

FILE: 3C 7.3

Minds on

Some Old Friends

Action!

Solving Right Triangles

Consolidation

What would you do?!

Learning Goal - I will be able to "solve" right triangles using trigonometry.

RAFT

If you have any outstanding assignments, work on them during RAFT.

Otherwise, you should be reading or finishing up work from this unit.

sin vs. \sin^{-1}

inverse
sin

We use the **sin**, **cos** and **tan** buttons when

we are given a reference angle

and we are solving for a side.

We use **\sin^{-1}** , **\cos^{-1}** and **\tan^{-1}** when we have

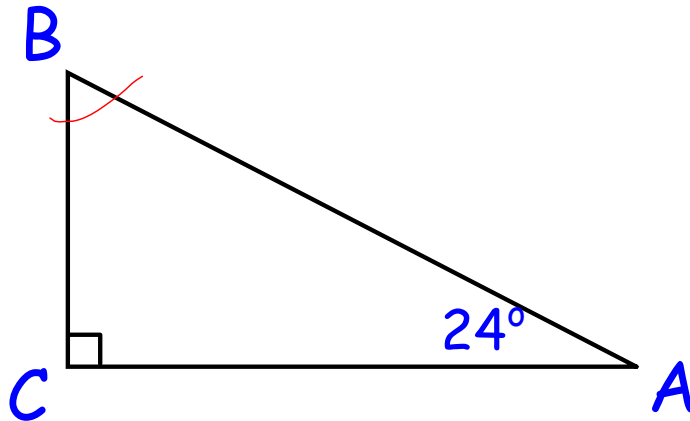
two Sides and we are solving

for an angle.

Minds on

Some Old Friends

Determine the measure of angle B.



$$B = 180 - 24 - 90$$

$$B = 66^\circ$$

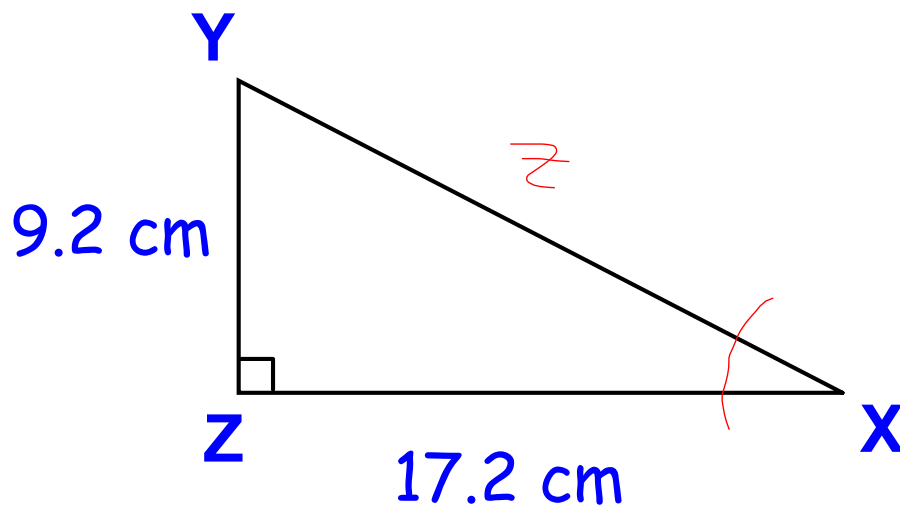
The sum of the angles in any triangle is

always 180°.

Minds on

Some Old Friends

Determine the measure of side z to one decimal place.



In a right triangle:

$$\underline{a^2} + \underline{b^2} = \underline{c^2}$$

where c is the hypotenuse of the

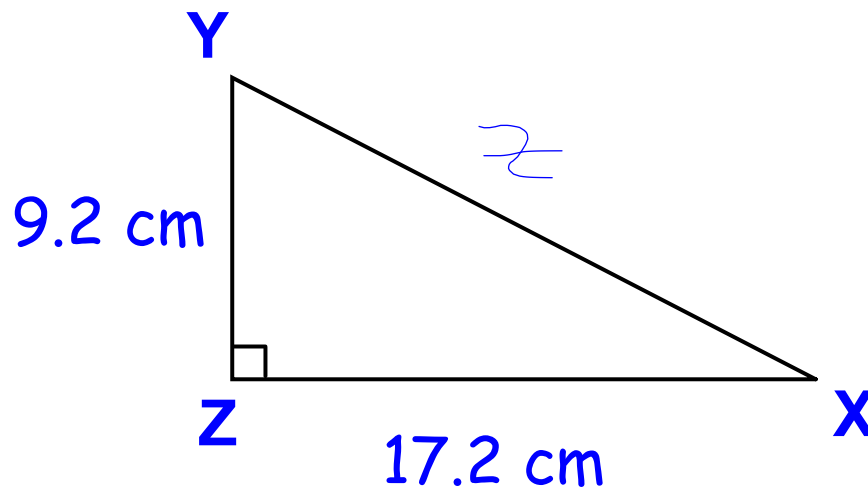
triangle.

$$x^2 + y^2 = z^2$$

Minds on

Some Old Friends

Determine the measure of side z to one decimal place.



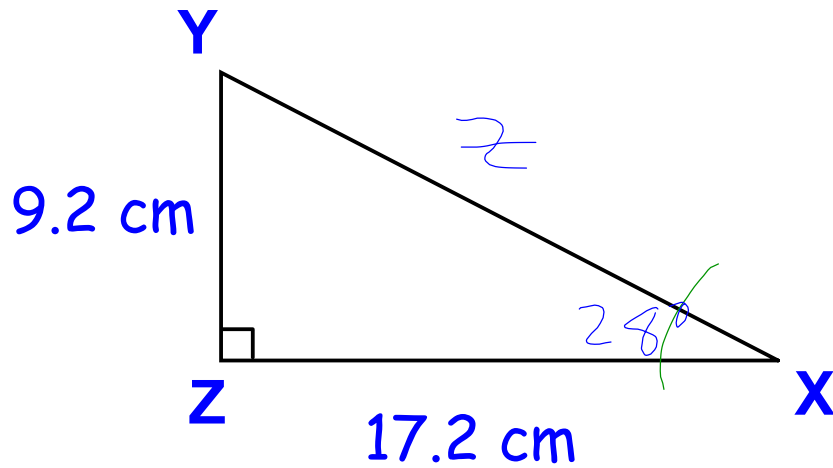
$$x^2 + y^2 = z^2$$

$$9.2^2 + 17.2^2 = z^2$$

$$84.64 + 295.84 = z^2$$

$$\sqrt{380.48} = z$$

$$z = 19.5 \text{ cm}$$



$$\tan X = \frac{9.2}{17.2}$$

$$\tan X = 0.5349$$

$$X = \tan^{-1} 0.5349$$

$$X = 28^\circ$$

$$\sin 28^\circ = \frac{9.2}{z}$$

$$z = \frac{9.2}{\sin 28}$$

$$z = 19.6$$

$$\cos 28^\circ = \frac{17.2}{z}$$

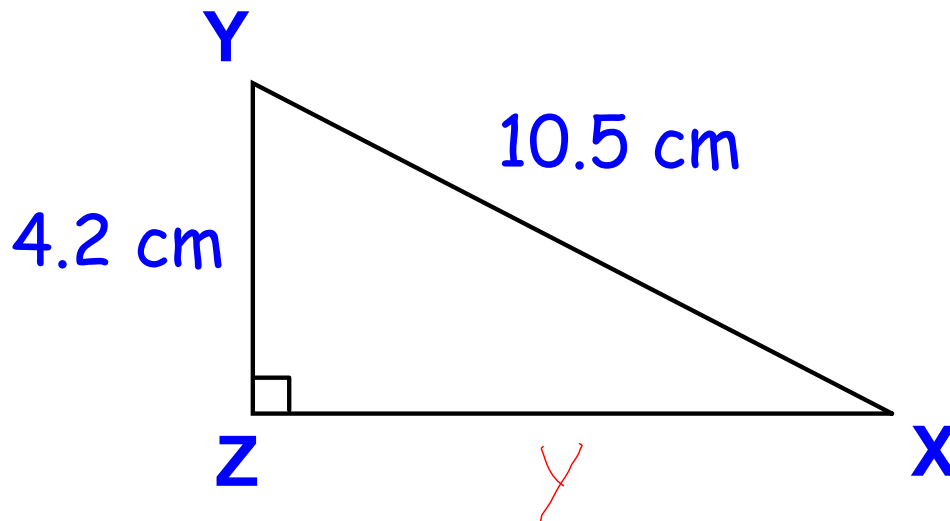
$$z = \frac{17.2}{\cos 28}$$

$$z = 19.9$$

Minds on

Some Old Friends

Determine the measure of side y to one decimal place.



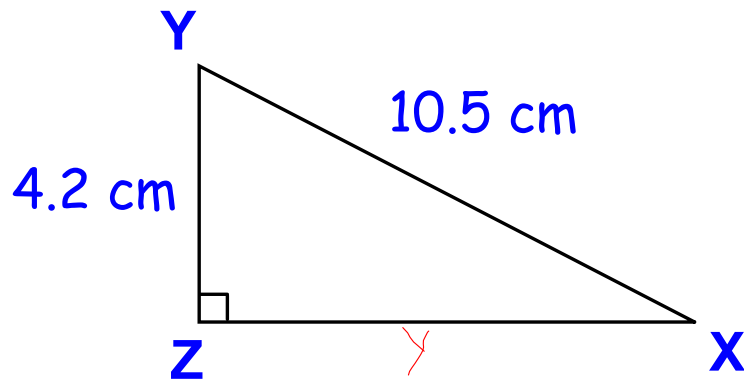
When we aren't looking for the

hypotenuse we need to
subtract.

Minds on

Some Old Friends

Determine the measure of side y to one decimal place.



$$\begin{aligned}x^2 + y^2 &= z^2 \\ -x^2 & \quad -x^2 \\ \hline y^2 &= z^2 - x^2 \\ y^2 &= 10.5^2 - 4.2^2 \\ y^2 &= 110.25 - 17.64 \\ \sqrt{y^2} &= \sqrt{92.61} \\ y &= 9.6 \text{ cm}\end{aligned}$$

Action!

"Solving" Right Triangles

To solve a triangle means to determine

the lengths of all the sides
and the measures of all the angles.

Consolidation

"Solving" Right Triangles

When we are solving right triangles we can use:

To Find Sides

$$a^2 + b^2 = c^2$$

The Pythagorean Theorem

sin cos tan

To Find Angles

sin⁻¹ cos⁻¹ tan⁻¹

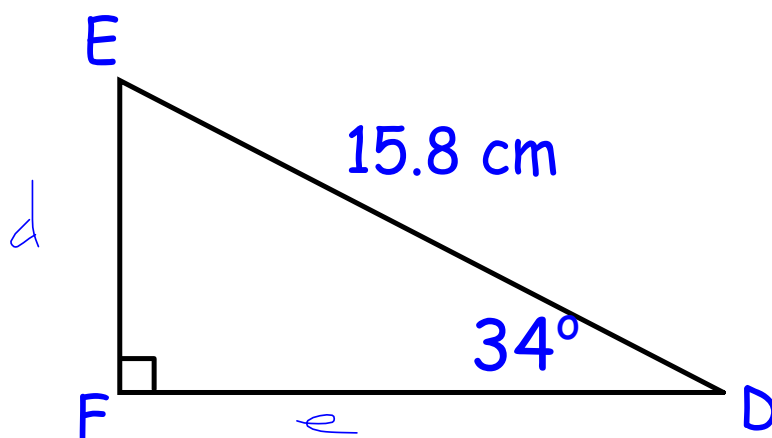
Subtract from 180°

The order in which you find the sides and angles is often up to you!

Consolidation

"Solving" Right Triangles

Solve the triangle!



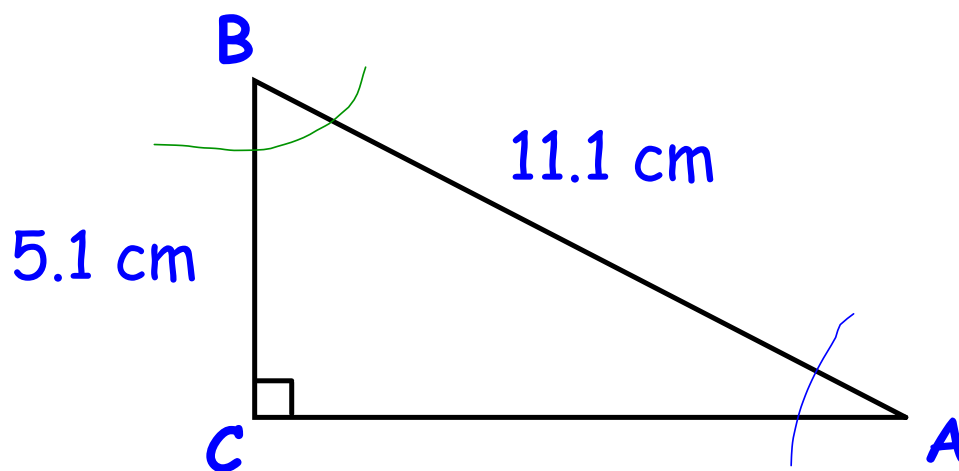
What would you do first??

We need angle E, side d and side e.

Subtract
from 180°

$$\sin 34 = \frac{d}{15.8}$$

$$\cos 34 = \frac{e}{15.8}$$

Consolidation**"Solving" Right Triangles****Solve the triangle!****What would you do first??**

side b

*Pythagorean
Theorem*

angle B

$$\cos B = \frac{5.1}{11.1}$$

angle A

$$\sin A = \frac{5.1}{11.1}$$