Sin and Cos Ratios (Tan too!)

Note Title 4/26/2012

Trig Ratios

$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{O}{H}$$ — OH / HELL

$$\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{A}{H}$$ — ANOTHER / HOUR

$$\tan\theta = \frac{\text{opposite}}{\text{adjacent}} = \frac{O}{A}$$ — OF / ALGEBRA

SOH CAH TOA

LABELLING THE TRIANGLE

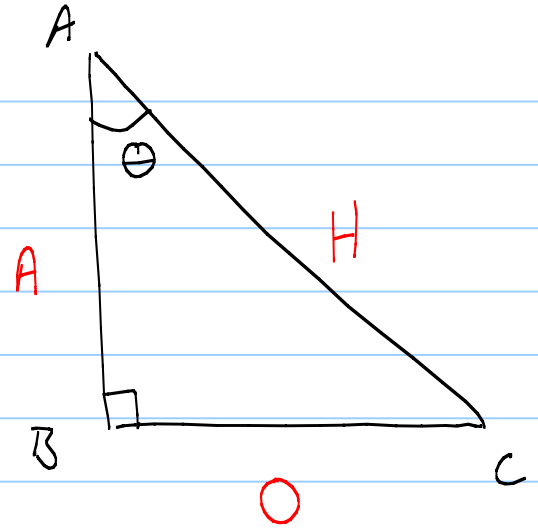
OPPOSITE SIDE - THE SIDE FARTHEST FROM THE ANGLE (θ) (DOES NOT TOUCH THE ANGLE).

HYPOTENUSE - LONGEST SIDE ACROSS FROM THE RIGHT ANGLE

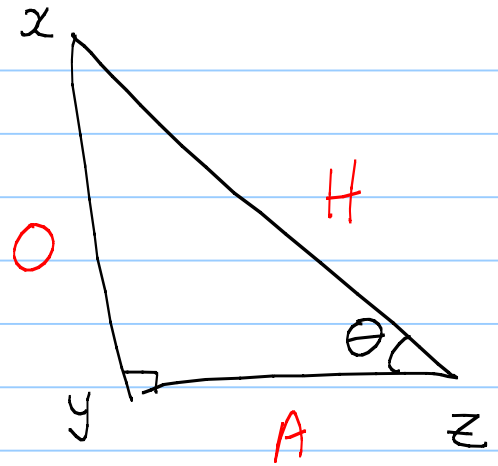
ADJACENT SIDE - THE REMAINING SIDE

IE LABEL THE TRIANGLE

#1



#2



TO FIND THE MISSING SIDE OF A RIGHT TRIANGLE

STEPS (1) DETERMINE THE MISSING SIDE AND THE GIVEN SIDE " WHAT SIDE YOU KNOW, WHAT SIDE DO YOU WANT TO KNOW"

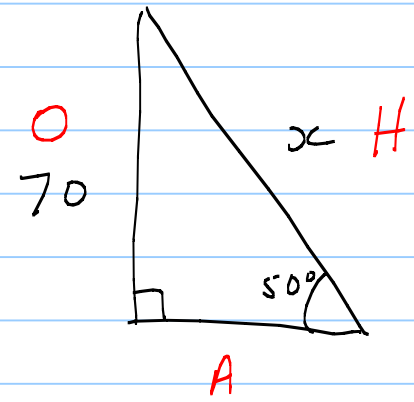
IE KNOW OPPOSITE, WANT THE HYPOTENUSE

(2) FROM (1) DETERMINE WHAT TRIG RATIO HAS THOSE TWO SIDES

IE $\sin\theta = \frac{O}{H}$

(3) WRITE OUT THE TRIG RATIO AND SUB IN ALL KNOWN VALUES

IE



$\sin\theta = \frac{O}{H}$

$\sin 50 = \frac{70}{x}$

(4) CHANGE THE TRIG ANGLE TO A DECIMAL

* USE YOUR CALCULATOR *

IE SIN 50 = 0.766

⑤ SOLVE FOR x

- IF UNKNOWN ON THE TOP - MULTIPLY THE NUMBERS

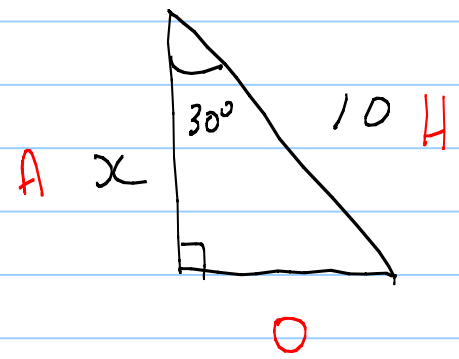
- IF UNKNOWN ON THE BOTTOM - DEVIDE THE TOP NUMBER BY THE DECIMAL

IE $\sin 50 = \frac{70}{x}$

$0.766 = \frac{70}{x}$ $\quad x = 70 \div 0.766$

$x = 91.38$

EG



$$\cos\theta = \frac{A}{H}$$

$$\cos 30 = \frac{x}{10}$$

$$0.866 = \frac{x}{10}$$

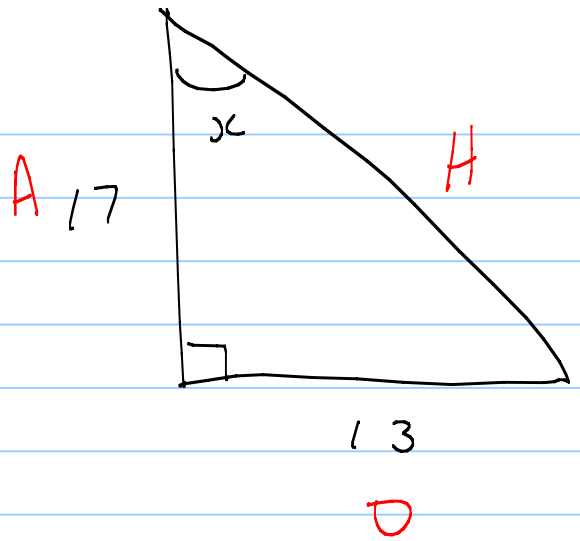
$$x = 10 \times 0.866$$

$$x = 8.66$$

* TO FIND THE MISSING ANGLE *

- DO THE SAME BUT WITH $\theta = x$ AND THEN USE SIN^{-1}, COS^{-1}, TAN^{-1}

Ex 6



$\tan\theta = \frac{O}{A}$

$\tan x = \frac{13}{17}$

$\tan x = 0.7647$

$\tan^{-1} 0.7647 = 37.4^\circ$

H/W Pg 107

1, 3, 4, 6, 9

Pg 120

1 – 10