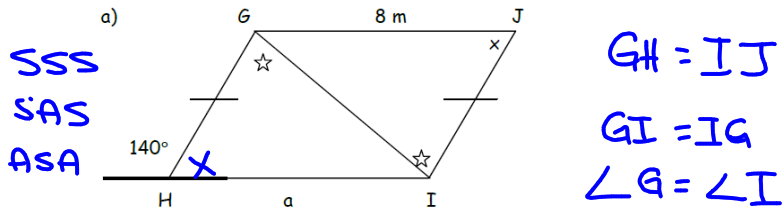


Congruent Triangles

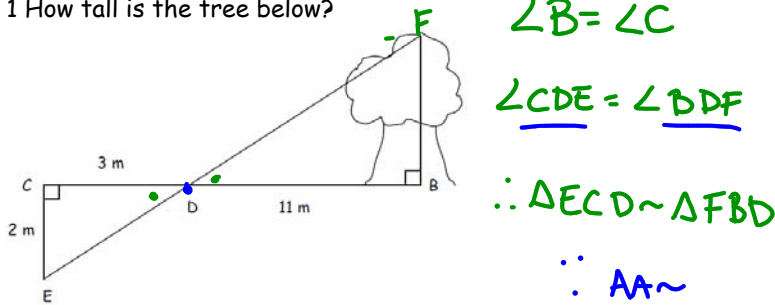
Prove the following triangles congruent and determine the value of each lower-case letter.



$\therefore \triangle GHI \cong \triangle IJG$
 $\therefore SAS$
 $\angle X = 180 - 140$ $a = 8m$
 $\angle X = 40^\circ$

Using Similar Triangles to Solve Problems

Ex. 1 How tall is the tree below?

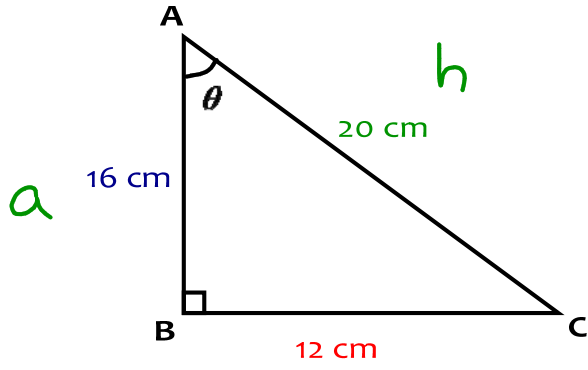


SSS~
SAS~
ASA~
AA~

$\frac{FB}{EC} = \frac{BD}{CD}$
 ~~$\frac{FB}{2} = \frac{11}{3}$~~
 $\therefore FB = \frac{11(2)}{3}$
 $FB = \frac{22}{3}$

SOH CAH TOA

Ex. 1 State the primary trigonometric ratios for angle θ



$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

Handwritten calculations for the ratios:

$$\sin \theta = \frac{16}{20}$$

$$\sin \theta = \frac{12}{20}$$

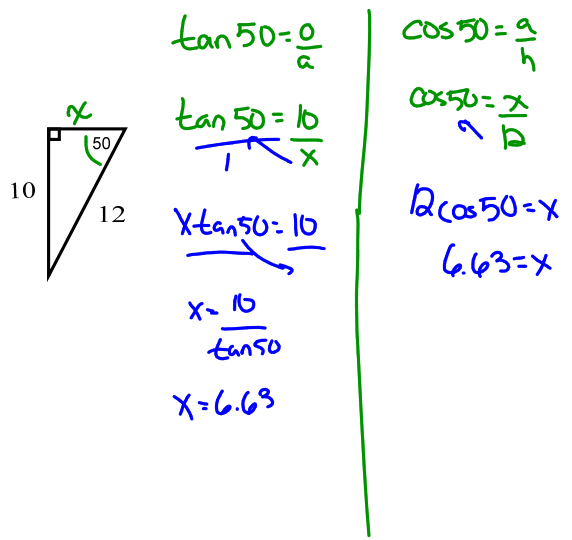
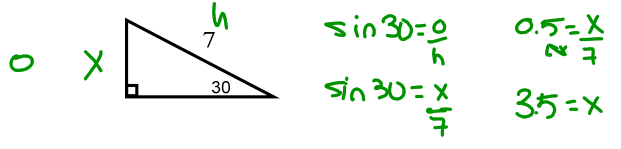
$$\cos \theta = \frac{12}{20}$$

$$\cos \theta = \frac{16}{20}$$

$$\tan \theta = \frac{12}{16}$$

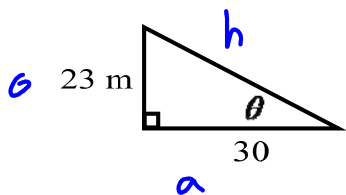
Primary Trig Ratios SOH CAH TOA

Solve for the unknown variable



SOH CAH TOA

Solve for the unknown variable



$$\tan \theta = \frac{23}{30}$$

$$\tan \theta = 0.767$$

$$\theta = \tan^{-1}(0.767)$$

$$\theta = 37.48$$

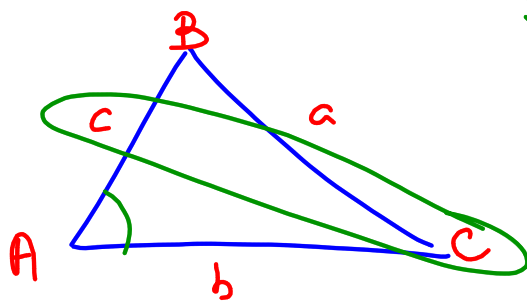
Ex. 1 Solve for the unknown variable

a) $\frac{\sin 72}{x} = \frac{\sin 43}{27}$
 $\frac{x}{\sin 72} = \frac{27}{\sin 43}$
 $x = \frac{27(\sin 72)}{\sin 43}$
 $x = 37.65$

b) $\frac{\sin \theta}{y} = \frac{\sin 59}{22.5}$
 $\frac{\sin 53}{y} = \frac{\sin 59}{22.5}$
 $\theta = 180 - 59 - 68$
 $\theta = 53$
 $\frac{y}{\sin 53} = \frac{22.5}{\sin 59}$
 $\frac{y}{0.80} = \frac{22.5}{0.86}$
 $y = \frac{22.5(0.86)}{0.80}$
 $y = 20.93$

c) $\frac{\sin \theta}{37.1} = \frac{\sin 44}{29.5}$
 $\sin \theta = \frac{37.1(\sin 44)}{29.5}$
 $\sin \theta = \frac{25.77}{29.5}$
 $\sin \theta = 0.87$
 $\sin \theta = 0.89$
 $\theta = \sin^{-1}(0.87)$
 $\theta = 60.46$

SINE LAW:



$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

$$\frac{\sin A}{a} = \frac{\sin C}{c}$$