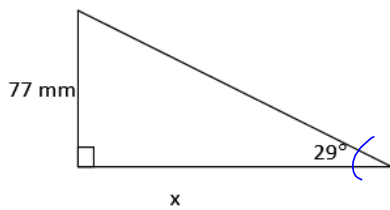


### Trigonometric Ratios

#### Warm up

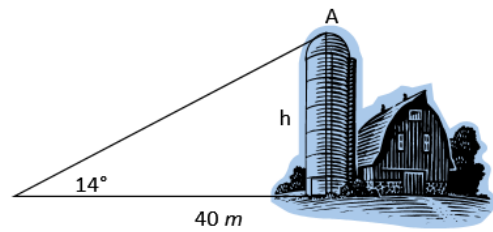
Use the tangent ratio to solve for the missing side in each triangle below.



$$\tan 29 = \frac{77}{x}$$

$$x \tan 29 = 77$$

$$x = \frac{77}{\tan 29^\circ}, x \approx 138$$



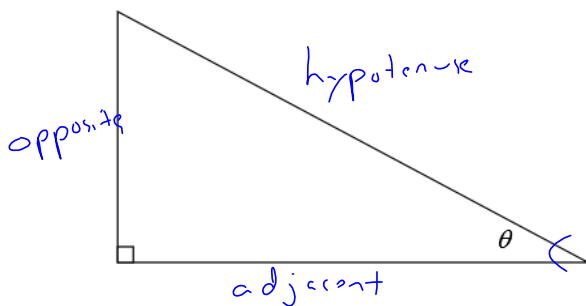
$$\tan 14^\circ = \frac{h}{40}$$

$$h = 40 \tan 14^\circ$$

$$h \approx 10$$

#### The Primary Trigonometric Ratios

Besides the tangent ratio, two other primary ratios that exist.



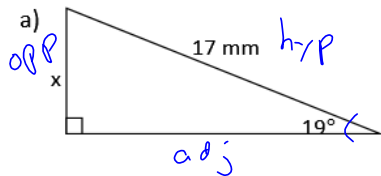
$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

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

SOH CAH TOA

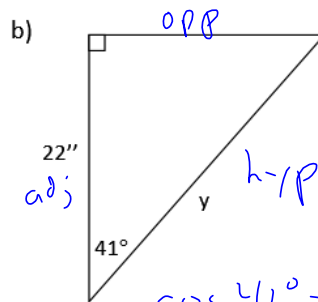
Examples – Solve for the missing side in each triangle below.



$$\sin 19 = \frac{x}{17}$$

$$x = 17 \sin 19^\circ$$

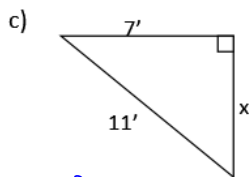
$$x \approx 5.5$$



$$\cos 41^\circ = \frac{22}{y}$$

$$y \cos 41^\circ = 22$$

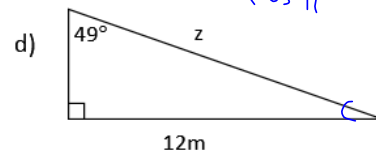
$$y = \frac{22}{\cos 41^\circ} \text{ or } y \approx 29.2''$$



$$11^2 = x^2 + 7^2$$

$$x^2 = 11^2 - 7^2$$

$$x \approx 8.5'$$

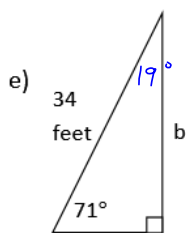


$$\sin 49^\circ = \frac{12}{z}$$

$$z \sin 49^\circ = 12$$

$$z = \frac{12}{\sin 49^\circ}$$

$$z \approx 15.9m$$

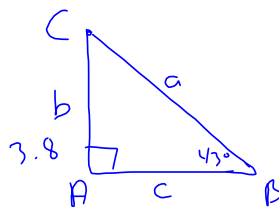


$$\sin 71 = \frac{b}{34}$$

$$b = 34 \sin 71^\circ$$

$$b \approx 32.2$$

f) In triangle ABC,  $A = 90^\circ$ ,  $B = 43^\circ$  and  $b = 3.8$  cm. Find the length of side a.



$$\sin 43^\circ = \frac{3.8}{a}$$

$$a = \frac{3.8}{\sin 43^\circ}$$

SOH CAH TOA – Practice

MPM2D

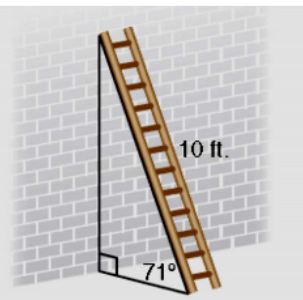
1. Text page 338 #6, 7
2. Text page 344 #6, 7
3. Find the missing side (as indicated by the variable) in each triangle below.

**a)**

**b)**

**c)**

4. A ladder 10 feet long is leaning against a wall at a  $71^\circ$  angle.
  - a) How far from the wall is the foot of the ladder?
  - b) How high up the wall does the ladder reach?



5. Text page 390 #3 - 5

**ANSWERS**

3. a) 1.4m b) 24 ft c) 59 inches 4. a) about 3 ft b) about 9 ft