

## 7.5 Apply the Tangent Ratio

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## Definitions

### Trigonometric Ratio

- Ratio~~x~~ of the lengths of two sides in a right triangle.
- Use these to find the measure of a side ~~x~~ <sup>or</sup> an acute angle

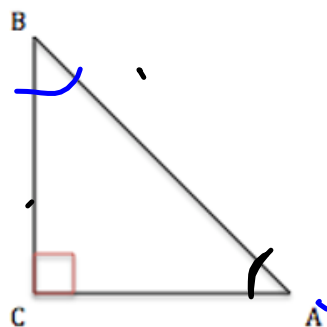
### Tangent

- Ratio of the length of the legs in a right triangle
- Is constant for a given angle measure

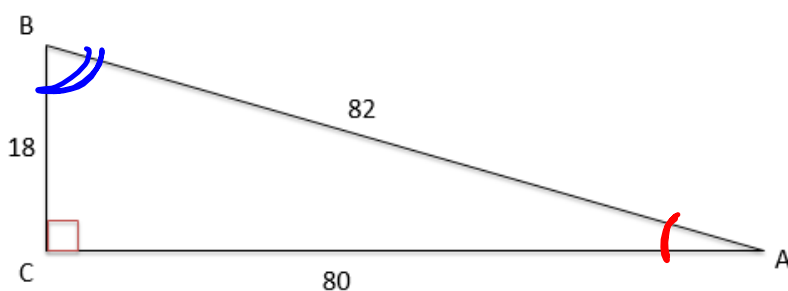
## Tangent

$$\tan A = \frac{\text{length of leg opposite of angle } A}{\text{length of leg adjacent to angle } A} = \frac{\text{opposite}}{\text{adjacent}} = \frac{\text{opp.}}{\text{adj.}} = \frac{BC}{CA}$$

$$\tan B = \frac{CA}{BC}$$

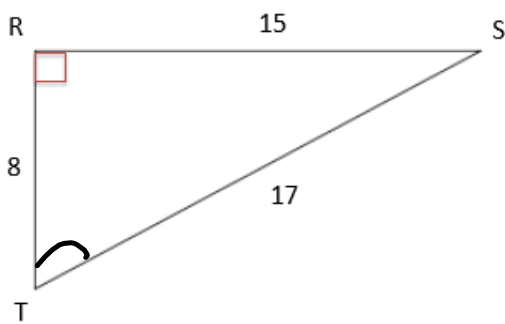


$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

Find  $\tan B$  and  $\tan A$ .

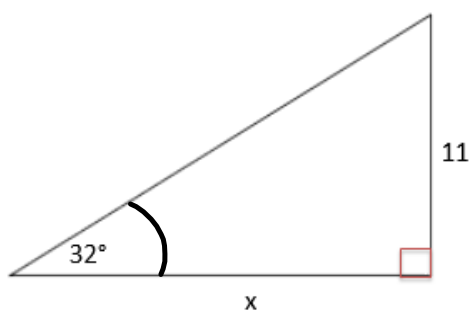
$$\tan B = \frac{\text{opp.}}{\text{adj.}} = \frac{CA}{BC} = \frac{80}{18} = 4.444$$

$$\tan A = \frac{BC}{CA} = \frac{18}{80} = \boxed{\frac{9}{40}} \quad \boxed{\frac{40}{9}}$$

Find  $\tan S$  and  $\tan T$ .

$$\tan S = \frac{RT}{RS} = \frac{8}{15}$$
$$\tan T = \frac{RS}{RT} = \frac{15}{8}$$

Find the value of  $x$ .



$$\cancel{x} \tan(32) = \left(\frac{11}{\cancel{x}}\right) \cancel{x}$$

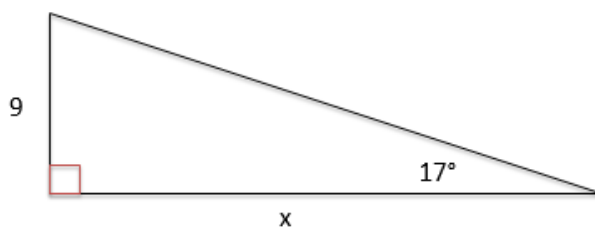
$$x \tan(32) = 11$$

$$x = \frac{11}{\tan(32)}$$

$$\frac{11}{\tan(32)}$$

$17.6$

Find the value of x.

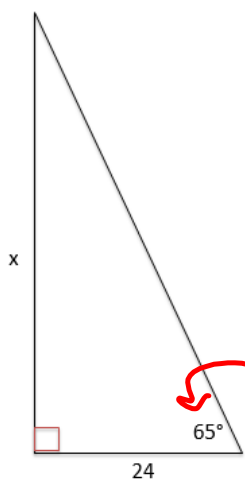


$$\tan 17 = \frac{9}{x}$$

$$x \tan 17 = 9$$

$$x = \frac{9}{\tan 17} = \boxed{29.4}$$

Find the value of x.



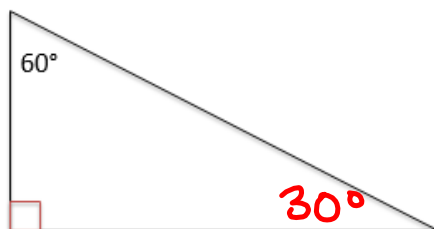
24

$$24(\tan 65) = \left(\frac{x}{24}\right) \cdot \frac{24}{1}$$

$$24 \cdot \tan 65 = x$$
$$\boxed{51.4 = x}$$



Use a Special Right Triangle to find the Tangent



Homework: p469 1-23