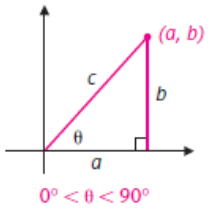
**Section 5.3 Solving right triangles**

Homework: p499 #13, 19, 23, 25, 27, 40, 49, 53

1. **Trig ratio**

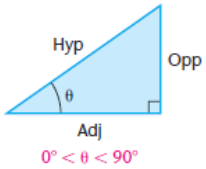



$$\sin\theta = \frac{b}{c} \qquad \csc\theta = \frac{c}{b}$$

$$\cos\theta = \frac{a}{c} \qquad \sec\theta = \frac{c}{a}$$

$$\tan\theta = \frac{b}{a} \qquad \cot\theta = \frac{a}{b}$$

2. **Right triangle ratio**



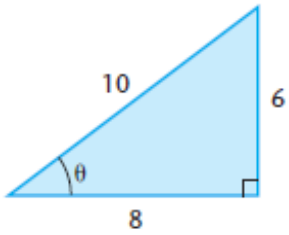

$0° < \theta < 90°$

$$\sin\theta = \frac{\text{Opp}}{\text{Hyp}} \qquad \csc\theta = \frac{\text{Hyp}}{\text{Opp}}$$

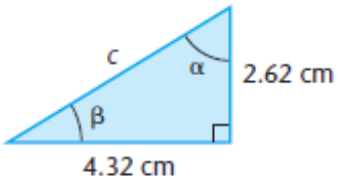
$$\cos\theta = \frac{\text{Adj}}{\text{Hyp}} \qquad \sec\theta = \frac{\text{Hyp}}{\text{Adj}}$$

$$\tan\theta = \frac{\text{Opp}}{\text{Adj}} \qquad \cot\theta = \frac{\text{Adj}}{\text{Opp}}$$

3. **Example** Consider the triangle below. Find $\cos\theta, \sin\theta, \tan\theta$ and $\cot\theta$



4. **Example** Solve the right triangle below



**Worksheet** Do the following problems

*In Problems 19–24, find each acute angle θ in degree measure to two decimal places using a calculator.*

**19.** $\cos\theta = 0.4917$

**20.** $\sin\theta = 0.0859$

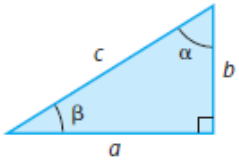
**21.** $\theta = \tan^{-1} 8.031$

**22.** $\theta = \cos^{-1} 0.5097$

**23.** $\sin\theta = 0.6031$

**24.** $\tan\theta = 1.993$

*In Problems 25–36, use the figure and the given information to solve each triangle.*




**25.** $\beta = 17.8°, c = 3.45$

**26.** $\beta = 33.7°, b = 22.4$

**27.** $\beta = 43°20', a = 123$

**28.** $\beta = 62°30', c = 42.5$

**29.** $\alpha = 23°0', a = 54.0$

**30.** $\alpha = 54°, c = 4.3$

**31.** $\alpha = 53.21°, b = 23.82$

**32.** $\alpha = 35.73°, b = 6.482$