8.

$x = \sqrt{\left(\sqrt{10}\right)^2 - \left(\sqrt{5}\right)^2}$

$x = \sqrt{10-5} = \sqrt{5}$

$\sin\theta = \frac{y}{r} = \frac{\sqrt{5}}{\sqrt{10}} = \frac{\sqrt{2}}{2}$

$\cos\theta = \frac{x}{r} = \frac{\sqrt{5}}{\sqrt{10}} = \frac{\sqrt{2}}{2}$

$\tan\theta = \frac{y}{x} = \frac{\sqrt{5}}{5} = 1$

$\csc\theta = \frac{r}{y} = \frac{\sqrt{10}}{\sqrt{5}} = \sqrt{2}$

$\sec\theta = \frac{r}{x} = \frac{\sqrt{10}}{\sqrt{5}} = \sqrt{2}$

$\cot\theta = \frac{x}{y} = \frac{\sqrt{5}}{\sqrt{5}} = 1$

14.

$\text{opposite side} = \sqrt{\sqrt{2}^2 - 1^2}$

$= \sqrt{2-1} = \sqrt{1} = 1$

$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{1}{1} = 1$

$\csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{\sqrt{2}}{1} = \sqrt{2}$

$\sec\theta = \frac{\text{hyp}}{\text{adj}} = \frac{\sqrt{2}}{1} = \sqrt{2}$

$\cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{1}{1} = 1$

For exercises 18 to 20, since $\tan\theta = \frac{y}{x} = \frac{4}{3}$, $y = 4, x = 3$, and $r = \sqrt{3^2 + 4^2} = 5$.

20.

$\sec\theta = \frac{r}{x} = \frac{5}{3}$

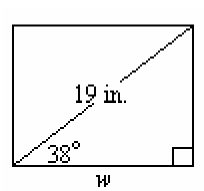
36.

$\csc\frac{\pi}{6} - \sec\frac{\pi}{3} = 2 - 2 = 0$

42.

$3\tan\frac{\pi}{4} + \sec\frac{\pi}{6}\sin\frac{\pi}{3} = 3\cdot 1 + \frac{2\sqrt{3}}{3}\cdot\frac{\sqrt{3}}{2} = 3 + 1 = 4$

60.

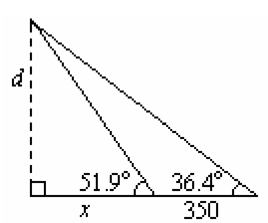


$\cos 38^\circ = \frac{\omega}{19}$

$\omega = 19\cos 38^\circ$

$\omega = 15 \text{ in}$

73.



$\tan 36.4 = \frac{d}{350 + x}$ $\qquad$ $\tan 51.9^\circ = \frac{d}{x}$

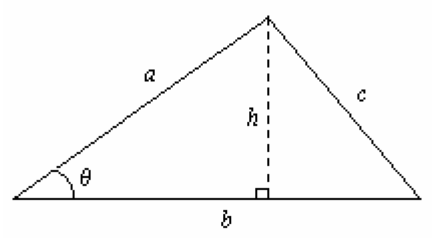
$x = \frac{d}{\tan 51.9^\circ}$

$\tan 36.4^\circ = \frac{d}{350 + \frac{d}{\tan 51.9^\circ}}$

$d = \frac{350\tan 36.4^\circ}{1 - \frac{\tan 36.4^\circ}{\tan 51.9^\circ}}$

$d \approx 612 \text{ ft}$

80.



$$\sin\theta = \frac{h}{a}$$
$$h = a\sin\theta$$

$$A = \frac{1}{2}bh$$
$$A = \frac{1}{2}b\left(a\sin\theta\right)$$
$$A = \frac{1}{2}ab\sin\theta$$