

2. $\sin \theta = \frac{7}{25}$, $\cos \theta = \frac{24}{25}$, $\tan \theta = \frac{7}{24}$, $\csc \theta = \frac{25}{7}$, $\sec \theta = \frac{25}{24}$, $\cot \theta = \frac{24}{7}$

4. The hypotenuse is obtained by the Pythagorean Theorem: $\sqrt{8^2 + 15^2} = \sqrt{289} = 17$. Then $\sin \theta = \frac{15}{17}$, $\cos \theta = \frac{8}{17}$, $\tan \theta = \frac{15}{8}$, $\csc \theta = \frac{17}{15}$, $\sec \theta = \frac{17}{8}$, $\cot \theta = \frac{8}{15}$

6. $b = \sqrt{7^2 - 3^2} = \sqrt{40} = 2\sqrt{10}$

(a) $\sin \alpha = \cos \beta = \frac{3}{7}$

(b) $\tan \alpha = \cot \beta = \frac{3}{2\sqrt{10}}$

(c) $\sec \alpha = \csc \beta = \frac{7}{2\sqrt{10}}$

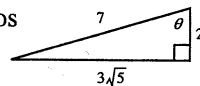
8. Since $\sin 45^\circ = \frac{12}{x}$, we have $x = \frac{12}{\sin 45^\circ} = \frac{12}{\frac{1}{\sqrt{2}}} = 12\sqrt{2}$.

10. Since $\tan 30^\circ = \frac{4}{x}$, we have $x = \frac{4}{\tan 30^\circ} = \frac{4}{\frac{1}{\sqrt{3}}} = 4\sqrt{3}$.

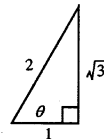
12. Since $\sin 53^\circ = \frac{25}{x}$, we have $x = \frac{25}{\sin 53^\circ} \approx 31.30339$.

14. $\frac{x}{4} = \tan \theta \Leftrightarrow x = 4 \tan \theta$, and $\frac{4}{y} = \cos \theta \Leftrightarrow y = \frac{4}{\cos \theta} = 4 \sec \theta$

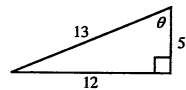
16. $\cos \theta = \frac{2}{7}$. The third side is $y = \sqrt{7^2 - 2^2} = \sqrt{45} = 3\sqrt{5}$. The other five ratios are $\sin \theta = \frac{3\sqrt{5}}{7}$, $\tan \theta = \frac{3\sqrt{5}}{2}$, $\csc \theta = \frac{7}{3\sqrt{5}}$, $\sec \theta = \frac{7}{2}$, and $\cot \theta = \frac{2}{3\sqrt{5}}$.



18. $\tan \theta = \sqrt{3}$. The third side is $r = \sqrt{1^2 + 3} = 2$. The other five ratios are $\sin \theta = \frac{\sqrt{3}}{2}$, $\cos \theta = \frac{1}{2}$, $\csc \theta = \frac{2}{\sqrt{3}}$, $\sec \theta = 2$, and $\cot \theta = \frac{1}{\sqrt{3}}$.



20. $\csc \theta = \frac{13}{12}$. The third side is $x = \sqrt{13^2 - 12^2} = 5$. The other five ratios are $\sin \theta = \frac{12}{13}$, $\cos \theta = \frac{5}{13}$, $\tan \theta = \frac{12}{5}$, $\sec \theta = \frac{13}{5}$, and $\cot \theta = \frac{5}{12}$.



28. The other leg = $100 \tan 75^\circ = 26.79$,
hypotenuse = $\frac{100}{\sin 75^\circ} = 103.52$, and the
other angle = $90^\circ - 75^\circ = 15^\circ$

