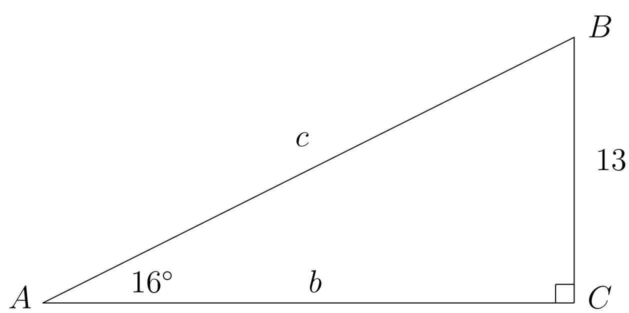
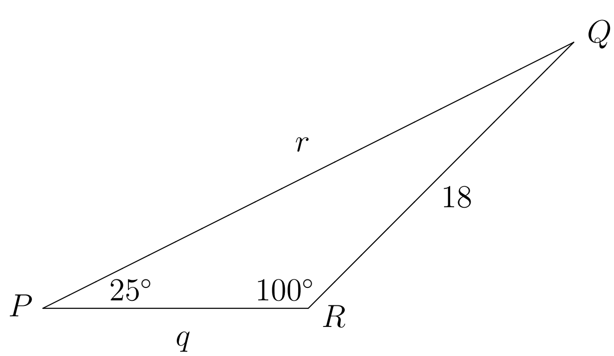
1. (a) Sketch the angle $\frac{3\pi}{2}$ in standard position.
   (b) Sketch the angle $-155°$ in standard position.
   (c) Find the length of an arc measuring $50°$, taken from a circle of radius 5.6 in. Round your answer to two decimal places.
   (d) Convert 5.24 radians to degrees. Round your answer to the nearest tenth of a degree.
2. (a) Suppose $\sin\theta = \frac{5}{7}$ and θ is in the first quadrant. Find $\sec\theta$.
   (b) Suppose $\sin\theta = .45$ and θ is in the second quadrant. Find $\cos\theta$.
   (c) Suppose $\cot\theta = 2$ and $\cos\theta < 0$. Find $\sin\theta$.
   (d) Suppose $\sec\theta = 4$ and $\sin\theta > 0$. Find $\csc\theta$.
3. Find the exact values of each of the following:

   (a) $\cos 45°$ (b) $\tan 30°$ (c) $\sin 240°$ (d) $\cos 120°$ (e) $\cot 90°$
4. Suppose a 50 ft-tall pole is supported by a wire, running from the top of the pole to the ground. If the wire is 80 ft in length, what angle does the wire make with the ground? Round your answer to the nearest tenth of a degree.
5. Solve the following triangle. Round all length measurements to two decimal places:



6. Solve the following triangle. Round all length measurements to two decimal places:



1. (a) This should start at the positive $x-$axis, wind around counterclockwise to the negative $y-$axis.
   (b) This angle should start at the positive $x-$axis and wind around clockwise to the third quadrant.
   (c) First, convert the angle to radians: $\theta = 50 \cdot \frac{\pi}{180} = .8726$ rad. Then the arc length is $s = r\theta = (5.6)(.8726) = 4.89$ in.
   (d) $5.24 \cdot \frac{180}{\pi} = 300.2°$.

2. (a) Since θ is in the first quadrant, $\sec\theta > 0$. Make a triangle with opposite side 5 and hypotenuse 7; solve for the adjacent side to get the adjacent side as being $\sqrt{24}$. Then $\sec\theta$ is the hypotenuse over the adjacent which is $\frac{7}{\sqrt{24}}$.
   (b) Since θ is in the second quadrant, $\cos\theta < 0$. Make a triangle with opposite side .45 and hypotenuse 1. Then solve for the adjacent side to get .89. Finally, $\cos\theta$ is (minus) the adjacent over the hypotenuse which is $-.89$.
   (c) Since $\cot\theta > 0$ and $\cos\theta < 0$, θ is in Quadrant III so $\sin\theta < 0$. Now draw a triangle with opposite side 2 and adjacent side 1; solve for the hypotenuse to get $\sqrt{5}$. The sine of θ is therefore (minus) the opposite over the hypotenuse, which is $\frac{-1}{\sqrt{5}}$.
   (d) Since $\sec\theta > 0$ and $\sin\theta > 0$, θ is in Quadrant I so $\csc\theta > 0$. Now draw a triangle with hypotenuse 4 and adjacent side 1; solve for the opposite side to get $\sqrt{15}$. Finally, $\csc\theta$ is the hypotenuse over the opposite which is $\frac{4}{\sqrt{15}}$.

3. (a) $\cos 45° = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$.
   (b) $\tan 30° = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$.
   (c) Since 240° is in the third quadrant, $\sin 240° < 0$. The reference angle is $240° - 180° = 60°$; $\sin 60° = \frac{\sqrt{3}}{2}$ so $\sin 240° = \frac{-\sqrt{3}}{2}$.
   (d) Since 120° is in the third quadrant, $\cos 120° < 0$. The reference angle is $180° - 120° = 60°$; $\cos 60° = \frac{1}{2}$ so $\cos 120° = \frac{-1}{2}$.
   (e) Given the angle 90°, think of the point $(0, 1)$; the cotangent of 90° is the adjacent side (0) over the opposite side (1), which is $\frac{0}{1} = 0$.

4. Draw a right triangle where the opposite side represents the pole; the adjacent side represents the ground, and the hypotenuse is the wire. Labelling the angle we want to find as θ, we have $\tan\theta = \frac{50}{80}$ (the opposite over the adjacent). Thus $\theta = \tan^{-1}(\frac{50}{80}) = 38.6°$.

5. First, find the remaining angle: $B = 180° - 16^{c}irc - 90° = 74°$. Next, find b using a trig ratio: I will set $\tan 74° = \frac{b}{13}$ and solve for b to get $b = 45.33$. Finally, by the Pythagorean Theorem we have $c^2 = 13^2 + 45.33^2$; solving for c we get $c = 47.15$.

6. Start by finding the remaining angle: $Q = 180° - 25° - 100° = 55°$. Next, use the Law of Cosines to find r. We have $r^2 = p^2 + q^2 - 2pq \cos R = 18^2 + 35^2 - 2(18)35 \cos 100°$ and therefore $r = 42.08$. Finally use the Law of Sines to find side q. One way to do this is to set $\frac{\sin 55°}{q} = \frac{\sin 100°}{42.08}$; solving for q we get $q = 35.00$