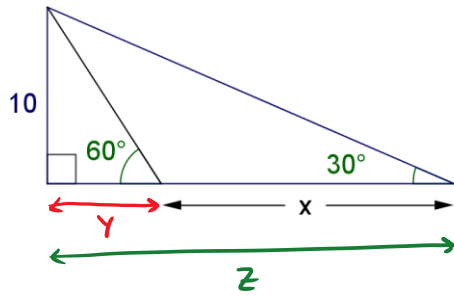


1. Find  $x$ .

$$\tan 60^\circ = \frac{10}{y} \rightarrow y = \frac{10}{\tan 60^\circ} = \frac{10}{\sqrt{3}}$$

$$\tan 30^\circ = \frac{10}{z} \rightarrow z = \frac{10}{\tan 30^\circ} = \frac{10}{\frac{1}{\sqrt{3}}} = 10\sqrt{3}$$

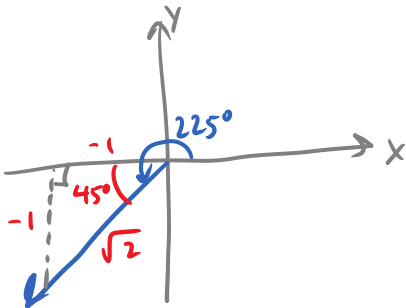
$$x = z - y = \boxed{10\sqrt{3} - \frac{10}{\sqrt{3}}} \approx 11.547$$



2. Find the exact value of each trigonometric function.

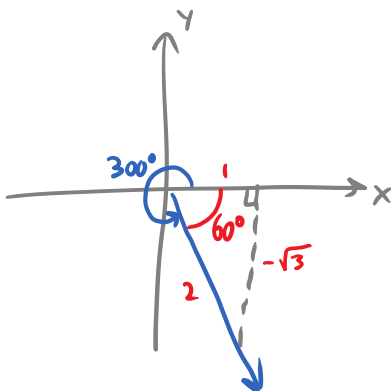
$$\text{a) } \tan 945^\circ = \tan 225^\circ = \frac{-1}{-1} = \boxed{1}$$

$$945^\circ - 720^\circ = 225^\circ$$



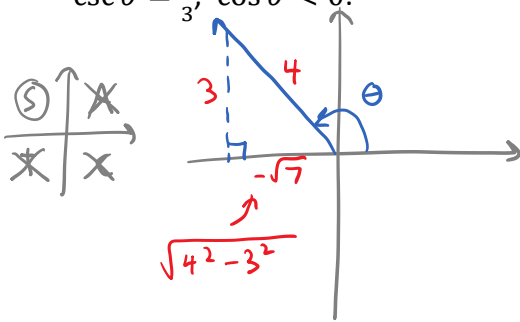
$$\text{b) } \sec 660^\circ = \sec 300^\circ = \boxed{2}$$

$$660^\circ - 360^\circ = 300^\circ$$



3. Find the values of the trigonometric functions of  $\theta$  from the given information:

$$\csc \theta = \frac{4}{3}, \quad \cos \theta < 0.$$

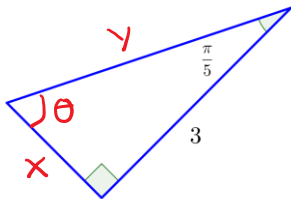


$$\begin{aligned} \sin \theta &= \frac{3}{4} \\ \cos \theta &= -\frac{\sqrt{7}}{4} \\ \tan \theta &= -\frac{3}{\sqrt{7}} \end{aligned}$$

$$\begin{aligned} \csc \theta &= \frac{4}{3} \\ \sec \theta &= -\frac{4}{\sqrt{7}} \\ \cot \theta &= -\frac{\sqrt{7}}{3} \end{aligned}$$

Q: What has four wheels and flies?

4. Solve the following right triangle.



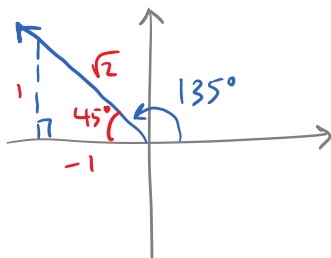
$$\theta = \frac{\pi}{2} - \frac{\pi}{5} = \frac{5\pi}{10} - \frac{2\pi}{10} = \frac{3\pi}{10}$$

$$\tan \frac{\pi}{5} = \frac{x}{3} \rightarrow x = 3 \tan \frac{\pi}{5} \approx 2.18$$

$$\cos \frac{\pi}{5} = \frac{3}{y} \rightarrow y = \frac{3}{\cos \frac{\pi}{5}} \approx 3.71$$

6. Find the exact value without a calculator.

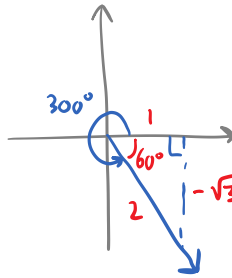
a)  $\sin 135^\circ$



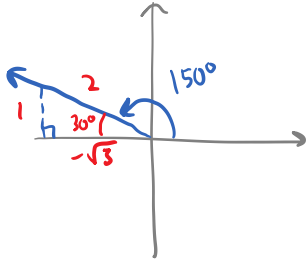
$$\sin 135^\circ = \frac{1}{\sqrt{2}} \quad \left( \text{or } \frac{\sqrt{2}}{2} \right)$$

c)  $\cos 660^\circ = \cos 300^\circ = \boxed{\frac{1}{2}}$

$$\begin{array}{r} 660^\circ \\ -360^\circ \\ \hline 300^\circ \end{array}$$

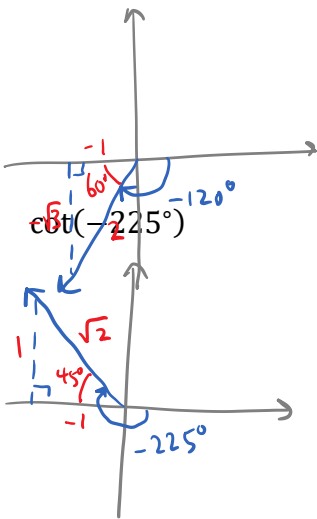


e)  $\tan 150^\circ$



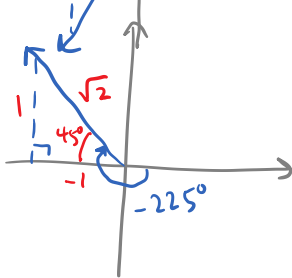
$$\tan 150^\circ = \frac{1}{-\sqrt{3}} = \boxed{-\frac{1}{\sqrt{3}}} \text{ (or } -\frac{\sqrt{3}}{3}\text{)}$$

g)  $\csc(-120^\circ)$



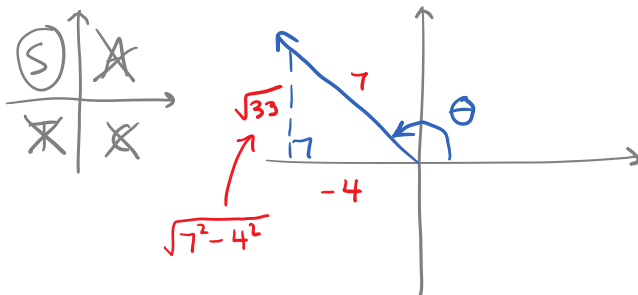
$$\csc(-120^\circ) = \frac{2}{-\sqrt{3}} = \boxed{-\frac{2}{\sqrt{3}}} \text{ (or } -\frac{2\sqrt{3}}{3}\text{)}$$

i)  $\cot(-225^\circ)$



$$\cot(-225^\circ) = \frac{-1}{-1} = \boxed{1}$$

8. Suppose  $\sec \theta = -\frac{7}{4}$  and  $\cot \theta < 0$ . Find  $\sin \theta$ .



$$\sin \theta = \boxed{\frac{\sqrt{33}}{7}}$$