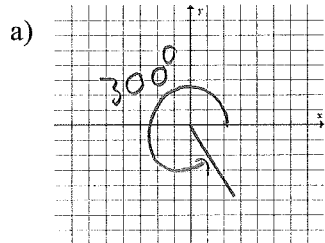


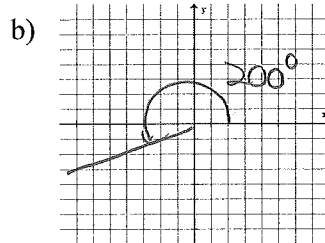
Chapter 2 Mid-Unit Review Trigonometry Assignment

1. Draw a sketch of each angle in standard position and find the reference angle.



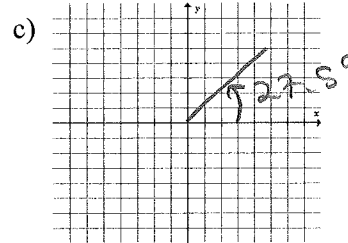
$$\theta = 300^\circ$$

$$\begin{aligned} \theta_R &= 360^\circ - 300^\circ \\ &= 60^\circ \end{aligned}$$



$$\theta = 200^\circ$$

$$\begin{aligned} \theta_R &= 200^\circ - 180^\circ \\ &= 20^\circ \end{aligned}$$



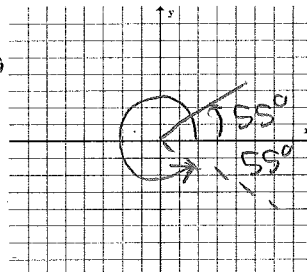
$$\theta = 27.5^\circ$$

$$\theta_R = 27.5^\circ$$

2. Determine the angle in standard position when 55° is reflected:

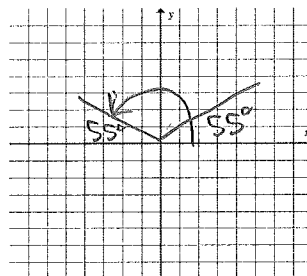
a) in the x-axis

$$\begin{aligned} \theta &= 360^\circ - 55^\circ \\ &= 305^\circ \end{aligned}$$



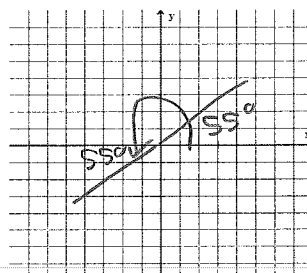
b) in the y-axis

$$\begin{aligned} \theta &= 180^\circ - 55^\circ \\ &= 125^\circ \end{aligned}$$

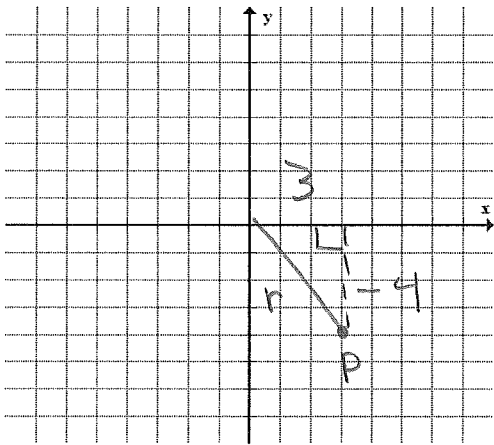


c) in the y-axis and the x-axis

$$\begin{aligned} \theta &= 180^\circ + 55^\circ \\ &= 235^\circ \end{aligned}$$



3. The point $P(3,-4)$ lies on the terminal arm of an angle θ , in standard position. Determine the exact trigonometric ratios for $\sin \theta$, $\cos \theta$ and $\tan \theta$.



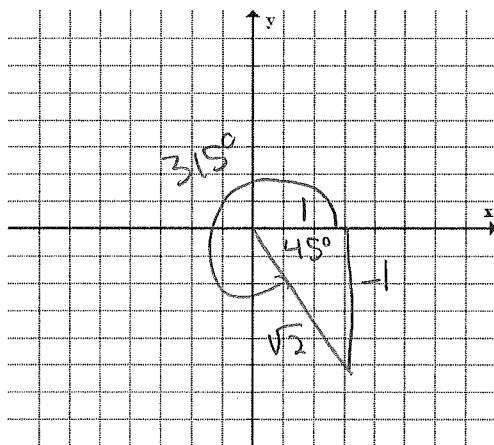
$$\begin{aligned}
 r &= \sqrt{x^2 + y^2} \\
 &= \sqrt{3^2 + (-4)^2} \\
 &= \sqrt{9 + 16} \\
 &= \sqrt{25} \\
 &= 5
 \end{aligned}$$

$$\sin \theta = \frac{y}{r} = \frac{-4}{5}$$

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

$$\tan \theta = \frac{y}{x} = \frac{-4}{3}$$

4. Determine the exact value of $\sin 315^\circ$

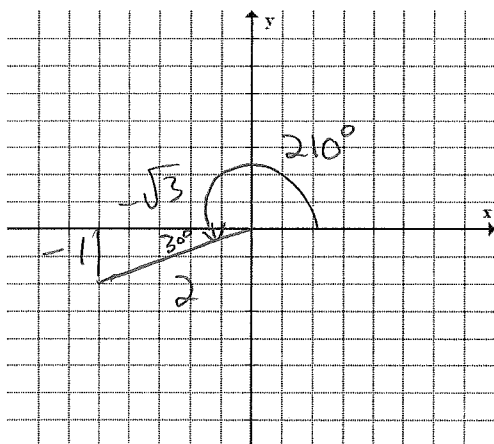


$$\begin{aligned}
 \theta_R &= 360^\circ - 315^\circ \\
 &= 45^\circ
 \end{aligned}
 \left. \vphantom{\begin{aligned} \theta_R &= 360^\circ - 315^\circ \\ &= 45^\circ \end{aligned}} \right\} \text{Find special triangle.}$$

$$\sin \theta = \frac{y}{r}$$

$$\sin 315^\circ = \frac{-1}{\sqrt{2}}$$

5. Determine the exact value of $\tan 210^\circ$



$$\begin{aligned}
 \theta_R &= 210^\circ - 180^\circ \\
 &= 30^\circ
 \end{aligned}
 \left. \vphantom{\begin{aligned} \theta_R &= 210^\circ - 180^\circ \\ &= 30^\circ \end{aligned}} \right\} \text{Find special triangle}$$

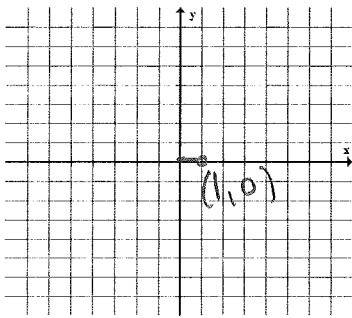
$$\tan \theta = \frac{y}{x}$$

$$\tan 210^\circ = \frac{-1}{-\sqrt{3}}$$

$$= \frac{1}{\sqrt{3}}$$

6. Determine the exact value of the sine, cosine and tangent values for each ratio.

a) 360°



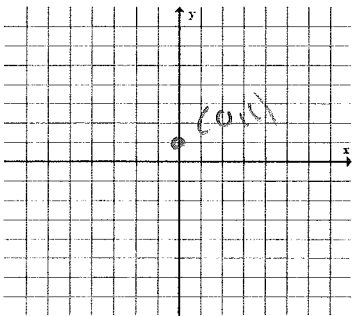
$$\begin{aligned} y &= 0 \\ x &= 1 \\ r &= 1 \end{aligned}$$

$$\sin 360^\circ = \frac{y}{r} = \frac{0}{1} = 0$$

$$\cos 360^\circ = \frac{x}{r} = \frac{1}{1} = 1$$

$$\tan 360^\circ = \frac{y}{x} = \frac{0}{1} = 0$$

b) 90°



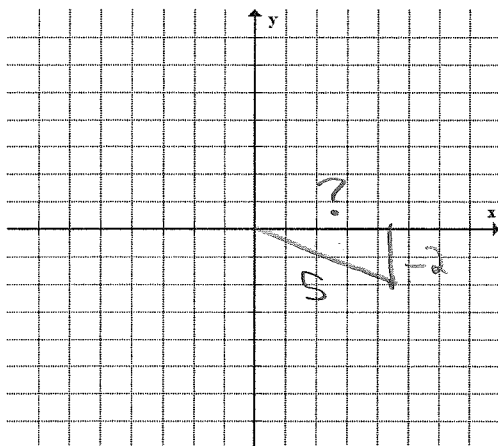
$$\begin{aligned} y &= 1 \\ x &= 0 \\ r &= 1 \end{aligned}$$

$$\sin 90^\circ = \frac{y}{r} = \frac{1}{1} = 1$$

$$\cos 90^\circ = \frac{x}{r} = \frac{0}{1} = 0$$

$$\tan 90^\circ = \frac{y}{x} = \frac{1}{0} = \text{D.N.E.}$$

7. Suppose θ is an angle in standard position with a terminal arm in quadrant 4, $\sin \theta = \frac{-2}{5}$. What is the exact value of $\cos \theta$ and $\tan \theta$.



$$\begin{aligned} x &= \sqrt{r^2 - y^2} \\ &= \sqrt{(5)^2 - (-2)^2} \\ &= \sqrt{25 - 4} \\ &= \sqrt{21} \end{aligned}$$

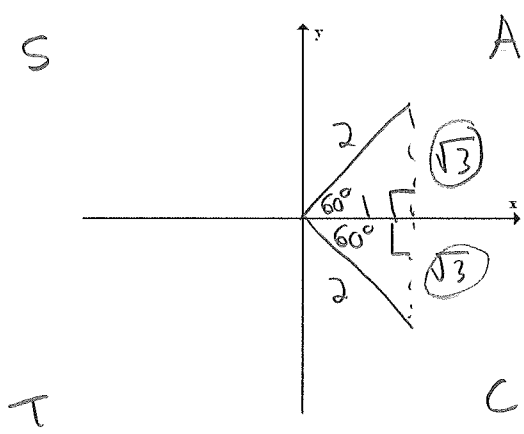
$$\begin{aligned} \cos \theta &= \frac{x}{r} \\ &= \frac{\sqrt{21}}{5} \end{aligned}$$

$$\begin{aligned} \tan \theta &= \frac{y}{x} \\ &= \frac{-2}{\sqrt{21}} \end{aligned}$$

8. Solve for θ .

a) $\cos \theta = \frac{1}{2}$

$0^\circ \leq \theta < 360^\circ$



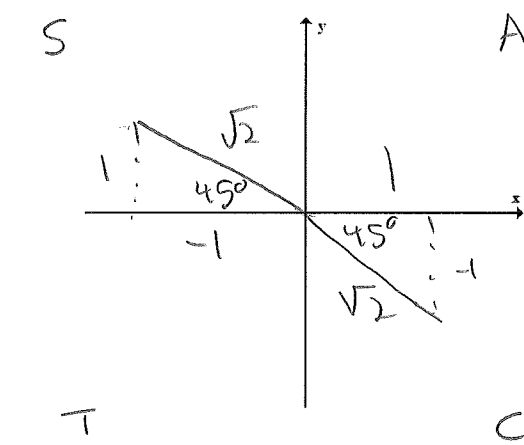
Cosine is positive in two quadrants
 \Rightarrow two triangles

$\theta_1 = 60^\circ$

$\theta_2 = 360^\circ - 60^\circ$
 $= 300^\circ$

a) $\tan \theta = -1$

$0^\circ \leq \theta < 360^\circ$

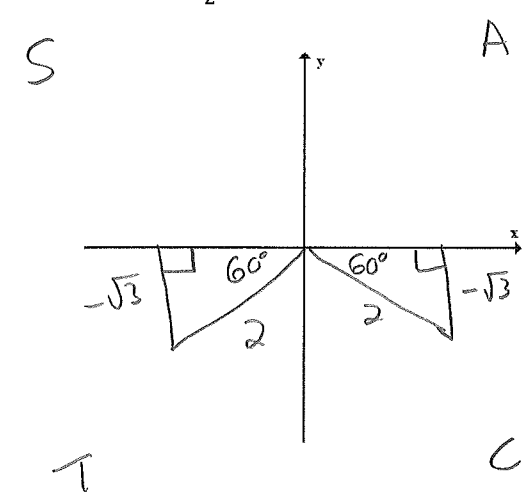


$\theta_1 = 180^\circ - 45^\circ$
 $= 135^\circ$

$\theta_2 = 360^\circ - 45^\circ$
 $= 315^\circ$

a) $\sin \theta = \frac{-\sqrt{3}}{2}$

$0^\circ \leq \theta < 360^\circ$

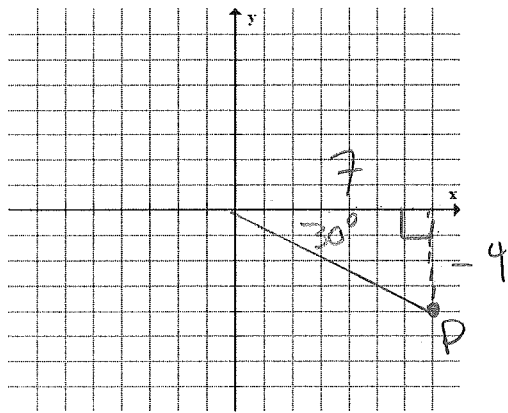


$\theta_1 = 180^\circ + 60^\circ$
 $= 240^\circ$

$\theta_2 = 360^\circ - 60^\circ$
 $= 300^\circ$

9. Point P(7,-4) is on the terminal arm of an angle θ .

a) Sketch the angle in standard position.



Not a special triangle, so

$$\begin{aligned}\tan \theta &= y/x \\ \tan \theta &= -4/7 \\ \theta &= \tan^{-1}(-4/7) \\ \theta &= 30^\circ\end{aligned}$$

b) State the reference angle

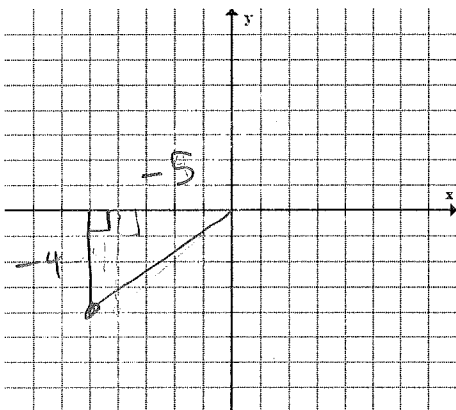
$$\theta_R = 30^\circ$$

c) State the angle θ

$$\begin{aligned}\theta &= 360^\circ - 30^\circ \\ &= 330^\circ\end{aligned}$$

10. Point P(-4,-4) is on the terminal arm of an angle θ .

a) Sketch the angle in standard position.



Not a special triangle

$$\begin{aligned}\tan \theta &= y/x \\ \tan \theta &= -4/5 \\ \theta &= \tan^{-1}(4/5) \\ \theta &= 38.7^\circ\end{aligned}$$

b) State the reference angle

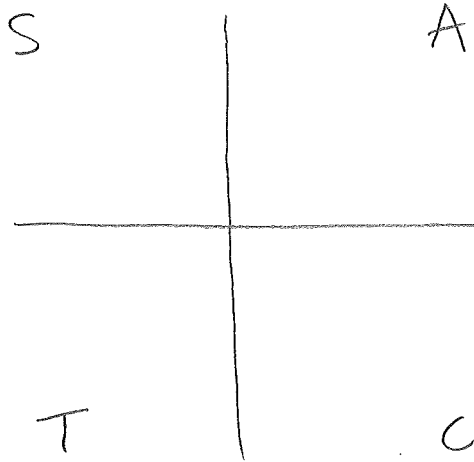
$$\theta_R = 38.7^\circ$$

c) State the angle θ

$$\begin{aligned}\theta &= 180^\circ + 38.7^\circ \\ &= 218.7^\circ\end{aligned}$$

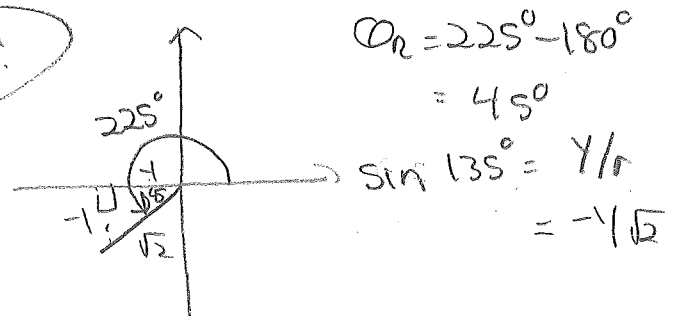
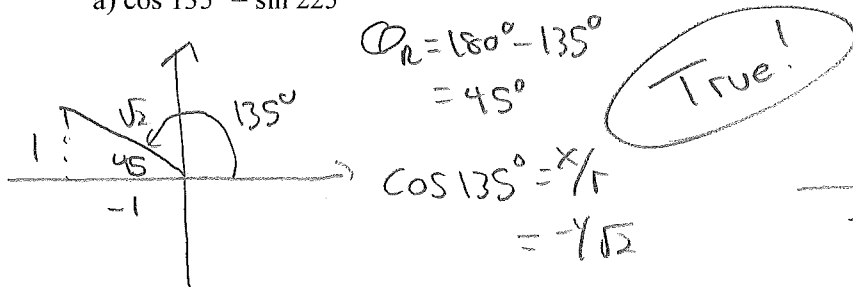
11. Without using a calculator, state whether each ratio is positive or negative.

- a) $\sin 80^\circ$
 80° Q I
 +
- b) $\tan 345^\circ$
 345° Q IV
 -
- c) $\cos 181^\circ$
 181° Q III
 -
- d) $\tan 280^\circ$
 280° Q IV
 -
- e) $\sin 165^\circ$
 165° Q II
 +

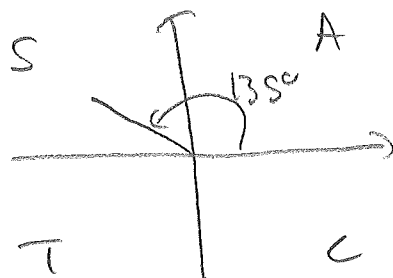


12. Without using technology, determine whether each statement is true or false. Prove your answer.

a) $\cos 135^\circ = \sin 225^\circ$



b) $\tan 135^\circ = \tan 225^\circ$

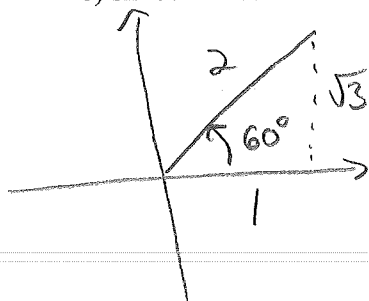


135° Q II
 $\tan 135^\circ = \ominus$

225° Q III
 $\tan 225^\circ = \oplus$

False!

c) $\sin 60^\circ = \cos 330^\circ$



True!

