

Part I: Find a negative and positive coterminal angle.

a) $-211^\circ + 360^\circ$
 -360°

b) $\frac{11\pi}{8} - \frac{16\pi}{8}$
 $+ \frac{16\pi}{8}$

c) 399°
 -360°
 39°
 -360°

d) $-\frac{13\pi}{3} + \frac{6\pi}{3} = -\frac{7\pi}{3}$
 $+ \frac{6\pi}{3} = -\frac{\pi}{3}$
 $+ \frac{4\pi}{3} = \frac{5\pi}{3}$

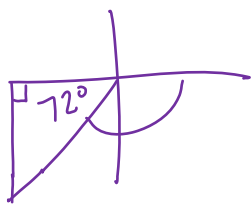
-571°
 149°

$-\frac{5\pi}{8}, \frac{27\pi}{8}$

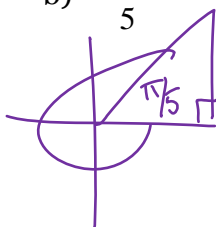
$-321^\circ, 39^\circ$

Part II: Draw the angle in standard position and the reference triangle. Be sure to label the reference angle.

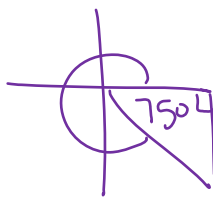
a) -108°



b) $-\frac{9\pi}{5}$

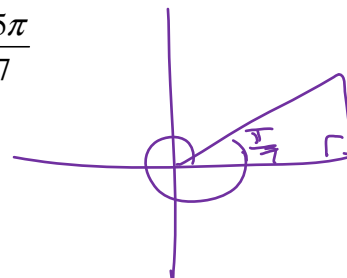


c) 285°



d) $\frac{15\pi}{7}$

2 1/7



Part III: Evaluate.

a) $\sec(89^\circ 42')$

$\frac{1}{\cos(89^\circ 42')}$
 $\cos(89^\circ 42')$

190.99

e) $\cos \theta = .48$

$\theta = \cos^{-1}(.48)$

$\theta = 61.31^\circ$

b) $\tan(-\frac{11\pi}{8})$

-2.41

f) $\cot \theta = -1.35$

$\tan^{-1}(\frac{-1}{1.35}) = \theta$

$\theta = -36.52^\circ$ or 323.47°

c) $\csc(-19^\circ)$

$\frac{1}{\sin -19}$

-3.07

g) $\sec \theta = 1.29$

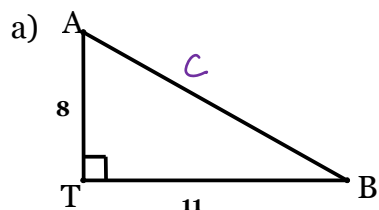
$\theta = \cos^{-1}(\frac{1}{1.29})$

$\theta = 39.18^\circ$

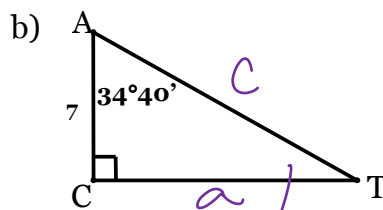
d) $\cos \frac{1\pi}{5}$

$.81$

Part IV: Solve the right triangle.



$\tan^{-1}(\frac{8}{11}) = B = 36.02^\circ$
 $\tan^{-1}(\frac{11}{8}) = A = 53.97^\circ$
 $c^2 = 8^2 + 11^2$ | $c = \sqrt{185}$



$55^\circ 20'$
 $\tan 34^\circ 40' = \frac{a}{7}$ | $a = 4.84$
 $\cos 34^\circ 40' = \frac{7}{c}$ | $c = 8.51$

Part V: Draw a picture and answer the question.

a) A ranger's tower is located 44m from a tall tree. From the top of the tower, the angle of elevation to the top of the tree is 28° , and the angle of depression to the base of the tree is 36° . How tall is the tree?

$\tan 28 = \frac{x}{44} \quad x = 23.395$
 $\tan 36 = \frac{y}{44} \quad y = 31.968$

55,36 m

b) From the top of a light house, the angle of depression of 2 ships on the opposite sides of the light house are observed as 45° and 30° angles. The height of the light house is 200 m. Find the distance between the ships.

$200 + 200\sqrt{3} \text{ m} \approx 546.4 \text{ m}$

Part VI: Find the radius and rotation angle of the given terminal point. Round to the nearest tenth.

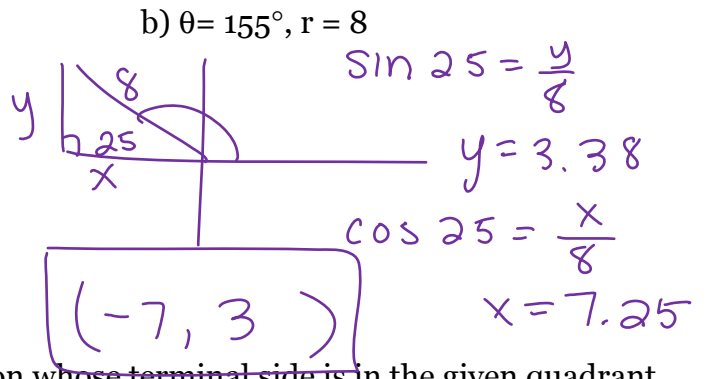
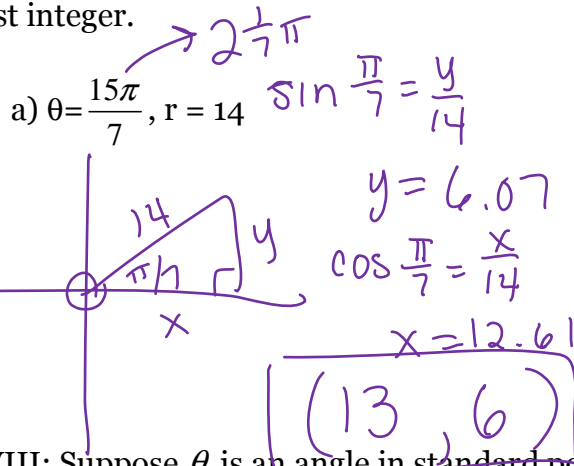
a) $(-6, -8) \quad r = 10 \quad \theta = 233.1^\circ$

b) $(-8, 8) \quad r = 8\sqrt{2}$

$\beta = \tan^{-1}\left(\frac{8}{6}\right)$
 $\beta = 53.13$

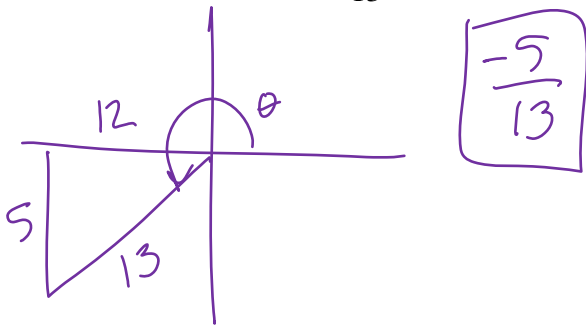
$\theta = 135^\circ$

Part VII: Find the terminal point given an angle in standard position and a radius. Round to the nearest integer.



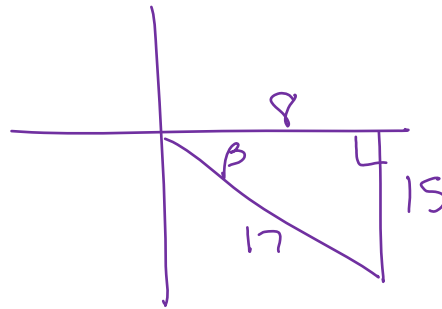
Part VIII: Suppose θ is an angle in standard position whose terminal side is in the given quadrant. For each function, find the exact values of the required trig ratios.

a) $\cos \theta = -\frac{12}{13}$, Quadrant III, find $\sin \theta$

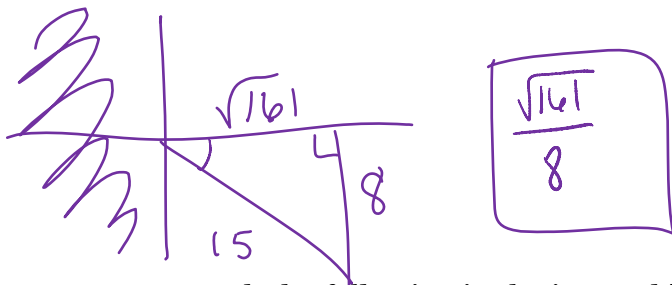


b) $\tan \theta = -\frac{15}{8}$, Quadrant IV, find $\sec \theta = \frac{17}{8}$

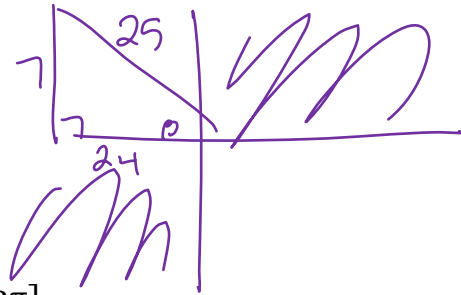
$\frac{1}{\cos \theta}$



c) $\sin \theta = -\frac{8}{15}$, $\sec \theta > 0$, find $\cot \theta$

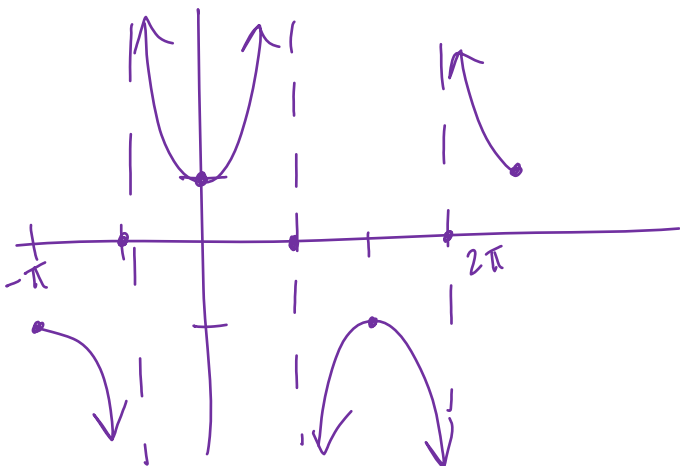


d) $\csc \theta = \frac{25}{7}$, $\tan \theta < 0$, find $\cot \theta = -\frac{24}{7}$



Part IX: Graph the following in the interval $[-\pi, 2\pi]$

a) $y = 3\sec \theta$



b) $y = \cot \theta - 4$

