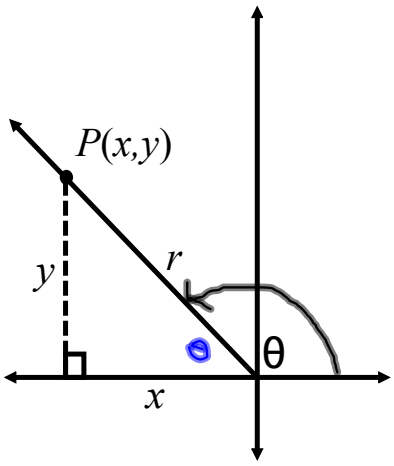
Trigonometric Functions of θ.

Let $P(x,y)$ be a point on the terminal side of θ in standard position. The distance from the origin to P is given by: $r = \sqrt{x^2 + y^2}$

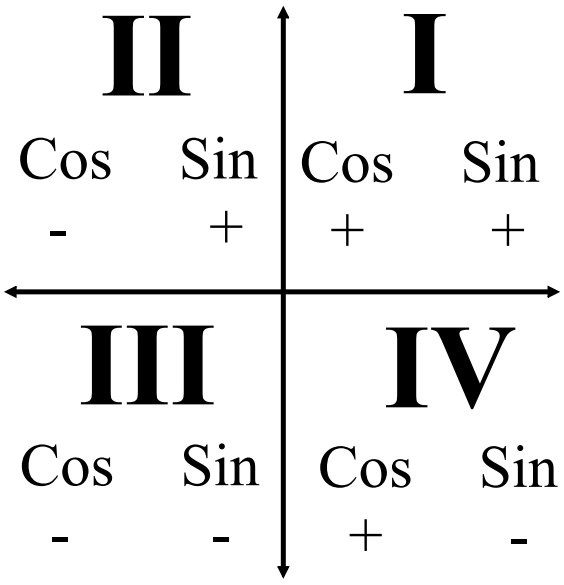
$$\sin\theta = \frac{y}{r} \qquad \csc\theta = \frac{r}{y}, y \neq 0$$

$$\cos\theta = \frac{x}{r} \qquad \sec\theta = \frac{r}{x}, x \neq 0$$

$$\tan\theta = \frac{y}{x}, x \neq 0 \qquad \cot\theta = \frac{x}{y}, y \neq 0$$



NOTE: cosine's sign corresponds with ***x*** and **sine's** sign corresponds with ***y***

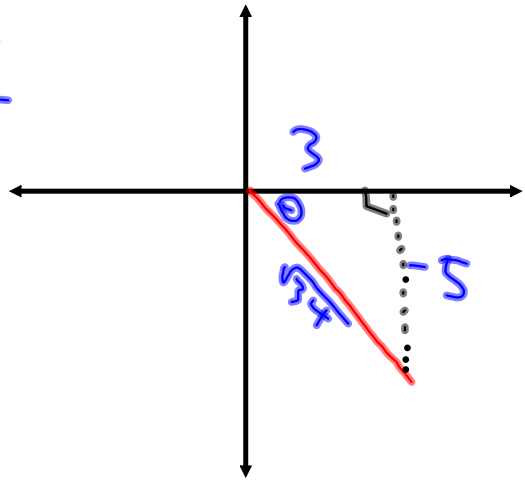


Let $P(3, -5)$ be a point on the terminal side of θ in standard position. Find the exact values of the six trigonometric functions of θ.

$\sin\theta = -\frac{5}{\sqrt{34}}$ $\quad$ $\csc\theta = -\frac{\sqrt{34}}{5}$

$\cos\theta = \frac{3}{\sqrt{34}}$ $\quad$ $\sec\theta = \frac{\sqrt{34}}{3}$

$\tan\theta = -\frac{5}{3}$ $\quad$ $\cot\theta = -\frac{3}{5}$

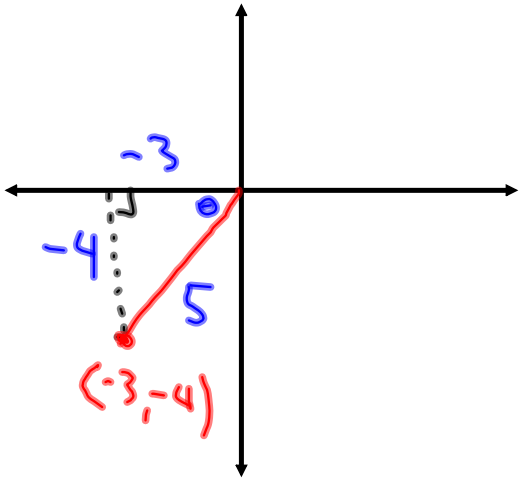


The terminal side of θ in standard position is in Quadrant III, and $\sin\theta = -\frac{4}{5}$. Find the exact values of the six trigonometric functions of θ.

$\sin\theta = -\frac{4}{5}$ $\quad\quad$ $\csc\theta = -\frac{5}{4}$

$\cos\theta = -\frac{3}{5}$ $\quad\quad$ $\sec\theta = -\frac{5}{3}$

$\tan\theta = \frac{4}{3}$ $\quad\quad$ $\cot\theta = \frac{3}{4}$



Find the number of rotations or the fraction of a rotation represented by each angle below. Indicate whether the rotation is clockwise or counterclockwise.

a. 90°

CCW

$\frac{90^\circ}{360^\circ} = \frac{1}{4}$ rotation

b. -640°

CW

$\frac{640^\circ}{360^\circ} = \frac{16}{9} = 1\frac{7}{9}$ rotation

Homework

Pg. 841-842 #32-68 even

32) -280°

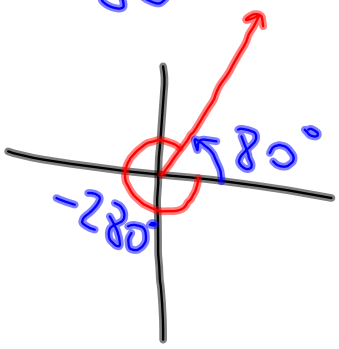
Coterminal

80°

Reference

$\hat{\theta} = 80^\circ$

$360 - 280 = 80$



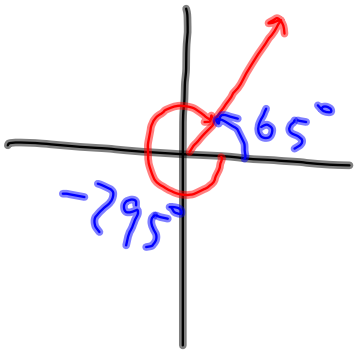
34) -295°

coterm.

$360 - 295 = \boxed{65^\circ}$

reference

$\theta = 65^\circ$



36) -540°

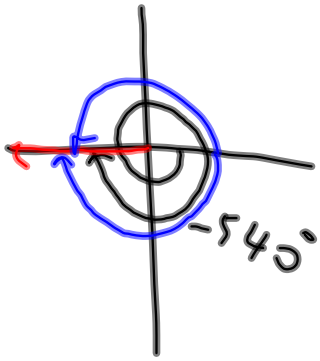
coterm.

180°

-180°

reference

0°

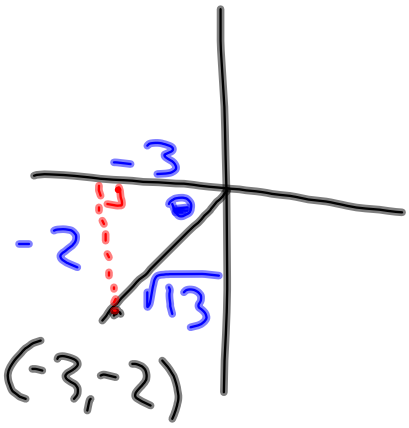


38)

$\sin\theta = -\frac{2}{\sqrt{13}}$ $\quad \csc\theta = -\frac{\sqrt{13}}{2}$

$\cos\theta = -\frac{3}{\sqrt{13}}$ $\quad \sec\theta = -\frac{\sqrt{13}}{3}$

$\tan\theta = \frac{2}{3}$ $\quad \cot\theta = \frac{3}{2}$

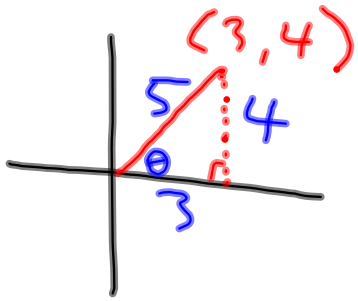


40) (3, 4)

$\sin\theta = \frac{4}{5}$ $\quad \csc\theta = \frac{5}{4}$

$\cos\theta = \frac{3}{5}$ $\quad \sec\theta = \frac{5}{3}$

$\tan\theta = \frac{4}{3}$ $\quad \cot\theta = \frac{3}{4}$

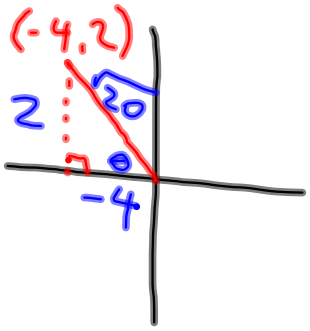


42) $(-4, 2)$

$\sin\theta = \frac{2}{\sqrt{20}}$ $\quad \csc\theta = \frac{\sqrt{20}}{2}$

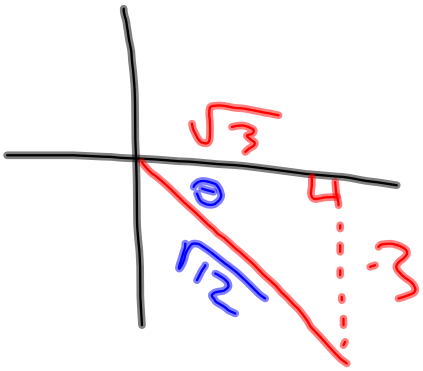
$\cos\theta = -\frac{4}{\sqrt{20}}$ $\quad \sec\theta = -\frac{\sqrt{20}}{4}$

$\tan\theta = -\frac{2}{4} = -\frac{1}{2}$ $\quad \cot\theta = -2$



44) $(\sqrt{3}, -3)$

$\sin\theta = -\frac{3}{\sqrt{12}}$ $\quad$ $\csc\theta = -\frac{\sqrt{12}}{3}$



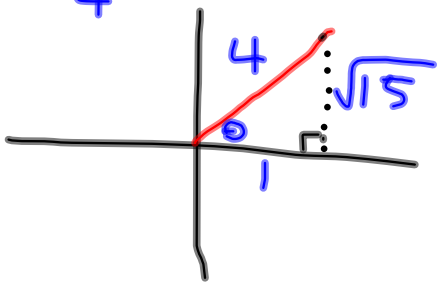
$\cos\theta = \frac{\sqrt{3}}{\sqrt{12}} = \frac{1}{2}$ $\quad$ $\sec\theta = 2$

$\tan\theta = -\frac{3}{\sqrt{3}}$ $\quad$ $\cot\theta = -\frac{\sqrt{3}}{3}$

48) I : $\cos\theta = .25$: $\tan\theta$

$\cos\theta = \frac{1}{4}$

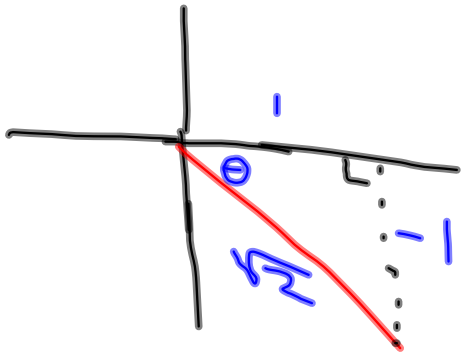
$\tan\theta = \sqrt{15}$



59) IV : $\tan\theta = -1$; $\csc\theta$

$\sin\theta = -\frac{1}{\sqrt{2}}$

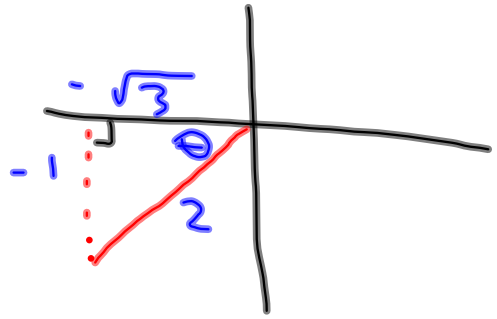
$\csc\theta = -\sqrt{2}$



52) III : $\sin\theta = -\frac{1}{2}$: $\sec\theta$

$\cos\theta = -\frac{\sqrt{3}}{2}$

$\sec\theta = -\frac{2}{\sqrt{3}}$



66) $\frac{120^\circ}{360^\circ} = \frac{1}{3} = 33\frac{1}{3}\%$

68)

a) $360° \times 60 = 21600$ minutes

b) $7926.41\pi \approx 24902$ mi

c) 1.15 mi.