

3-6-18 1st Trig

Coterminal

① 150° and 1470°

$$1470 - 150 = \frac{1320}{360} = 3.6$$

NO

② $\frac{3\pi}{11}$ and $\frac{69\pi}{11}$

$$\frac{69\pi}{11} - \frac{3\pi}{11} = \frac{66\pi}{11} = 6\pi$$

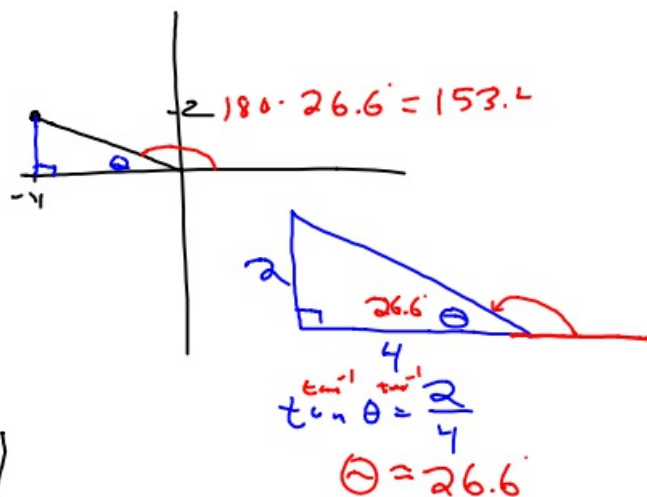
Yes

③ $-\frac{\pi}{3}$ and $\frac{14\pi}{3}$

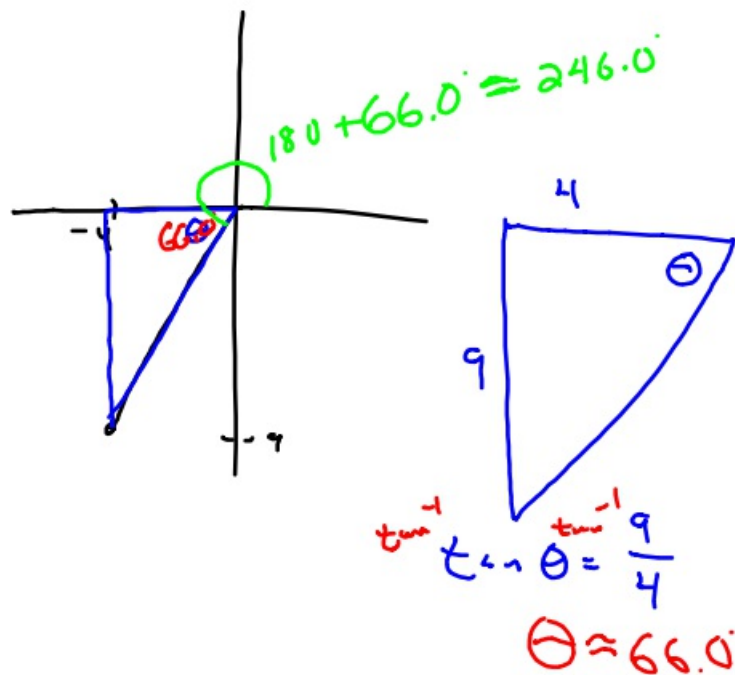
$$\frac{14\pi}{3} - -\frac{\pi}{3} = \frac{15\pi}{3} = 5\pi$$

NO

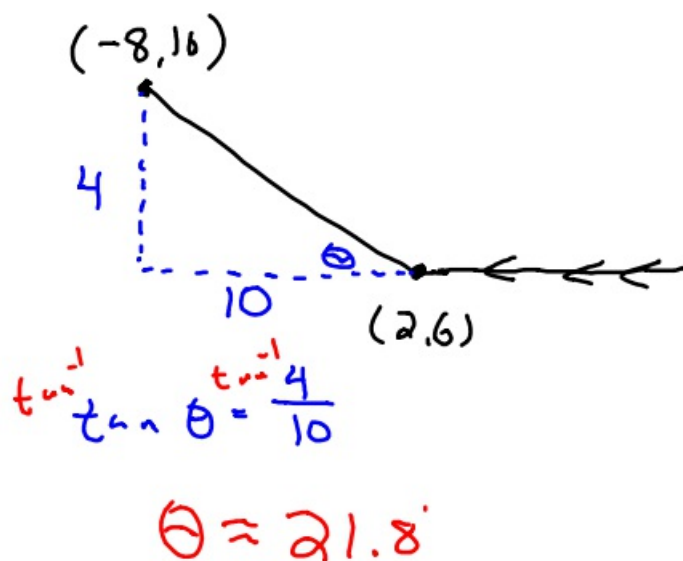
- ④ Give the angle opening of θ from initial angle of 0° to terminating side if it goes through the point $(-4, 2)$.



⑤ $(-4, -9)$



⑥ An airplane is traveling due West. It must turn North when it gets to $(2, 6)$ and go to $(-8, 10)$. How many degrees does it turn?



⑦ Change 10° to radians.

$$\cancel{10} \cdot \frac{\pi}{\cancel{180} \cdot 18} = \frac{\pi}{18}$$

⑧ If $\sin \theta = \frac{11}{258}$, what is $\csc \theta$?

Since they are reciprocals,

$$\csc \theta = \frac{258}{11}.$$

3-6-18 3rd Trig

① Are 310° and 4590°
coterminal?

$$4590 - 310 = \frac{4280}{360} = 11.\bar{8}$$

No.

② Are $\frac{4\pi}{7}$ and $\frac{32\pi}{7}$ coterminal?

$$\frac{32\pi}{7} - \frac{4\pi}{7} = \frac{28\pi}{7} = 4\pi$$

Yes

③ Change $\frac{2\pi}{5}$ to degrees.

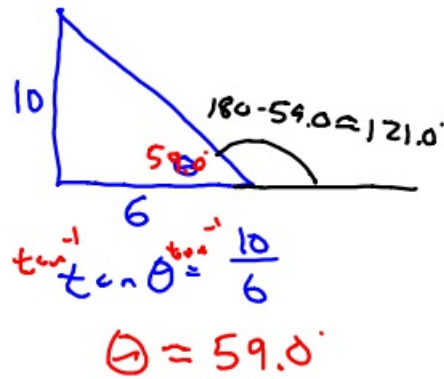
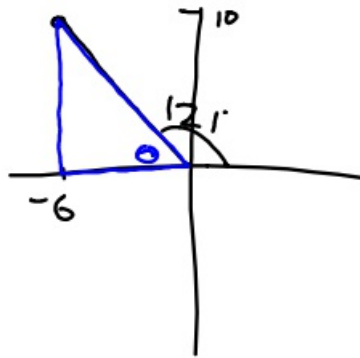
$$\frac{\cancel{2\pi}}{5} \cdot \frac{180^\circ}{\cancel{\pi}} = \frac{360^\circ}{5} = 72^\circ$$

④ If $\sin \theta = \frac{11}{19}$, what is $\csc \theta$?

Since they are reciprocals,

$$\csc \theta = \frac{19}{11}$$

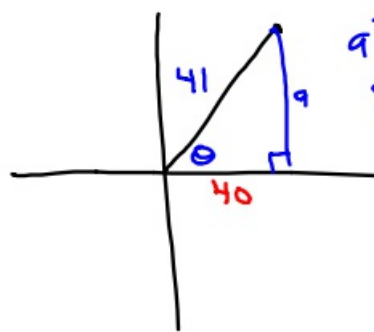
- ⑤ Find the opening of the angle from the initial side being at 0° and the terminal side going through $(-6, 10)$.



- ⑥ If $\sin \theta = \frac{9}{41}$, find

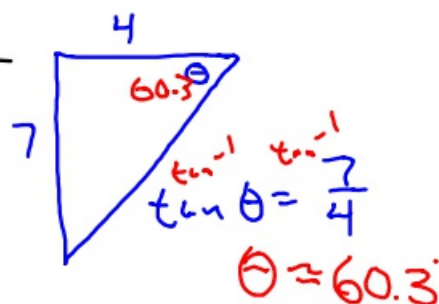
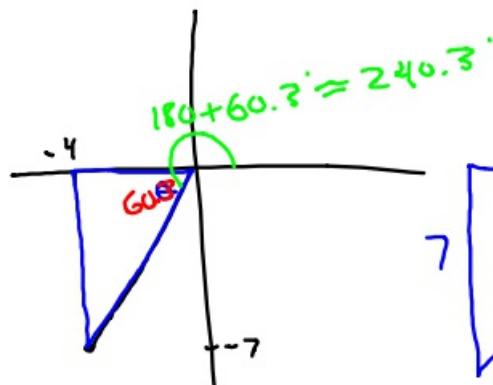
$$\cos \theta = \frac{40}{41}$$

$$\cot \theta = \frac{40}{9}$$



$$\begin{aligned}
 a^2 + b^2 &= 41^2 \\
 81 + b^2 &= 1681 \\
 b^2 &= 1600 \\
 b &= 40
 \end{aligned}$$

- ⑦ Find the angle opening from the initial side starting at 0° to the terminal side that goes through $(-4, -7)$.



3-6-18 4th Trig

① Are 40° and 760° coterminal?

$$760 - 40 = \frac{720}{360} = 2 \text{ perfect rotations}$$

Yes

② Are $\frac{7\pi}{3}$ and $\frac{67\pi}{3}$ coterminal?

$$\frac{67\pi}{3} - \frac{7\pi}{3} = \frac{60\pi}{3} = \frac{20\pi}{2\pi} = 10 \text{ rot.}$$

Yes

③ If $\sin \theta = \frac{82}{139}$, find $\csc \theta$.

Since they are reciprocals,
 $\csc \theta = \frac{139}{82}$.

④ In which quadrant is 2040° ?

$$\frac{2040}{360} = 5.6$$

Full 5 rotations is 5×360
which is 1800°

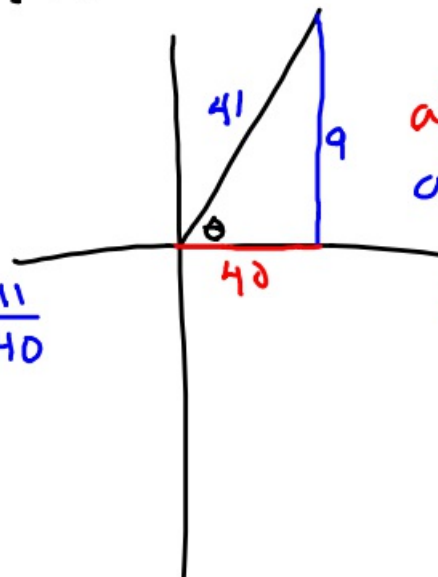
$$2040 - 1800 = \underline{240}$$

III

⑤ If θ is in 1st quadrant and $\sin \theta = \frac{9}{41}$, find

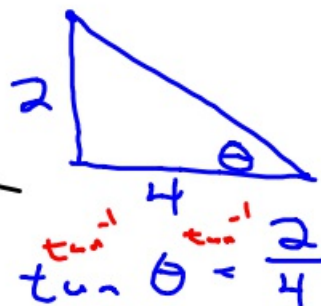
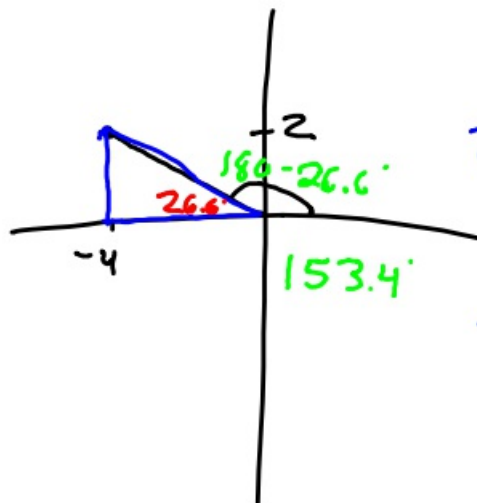
$$\tan \theta = \frac{9}{40}$$

$$\sec \theta = \frac{\text{hyp}}{\text{adj}} = \frac{41}{40}$$



$$\begin{aligned} a^2 + 9^2 &= 41^2 \\ a^2 + 81 &= 1681 \\ a^2 &= 1600 \\ a &= 40 \end{aligned}$$

⑥ Find the angle opening if the terminal side goes through $(-4, 2)$.



$$\tan \theta = \frac{2}{4}$$

$$\theta \approx 26.6^\circ$$

① An airplane is flying due East. At the point $(2,6)$ it turns North to go to $(7,8)$. How many degrees does it turn?

