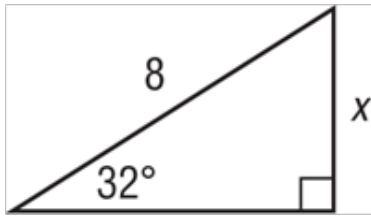


Stick Quiz

Find the missing values.

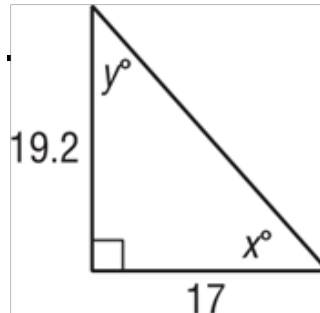
1.



$$\sin 32 = x/8$$

$$x=4.24 \text{ units}$$

2.



$$\tan x = 19.2/17$$

$$x = 48.48 \text{ deg}$$

$$\tan y = 17/19.2$$

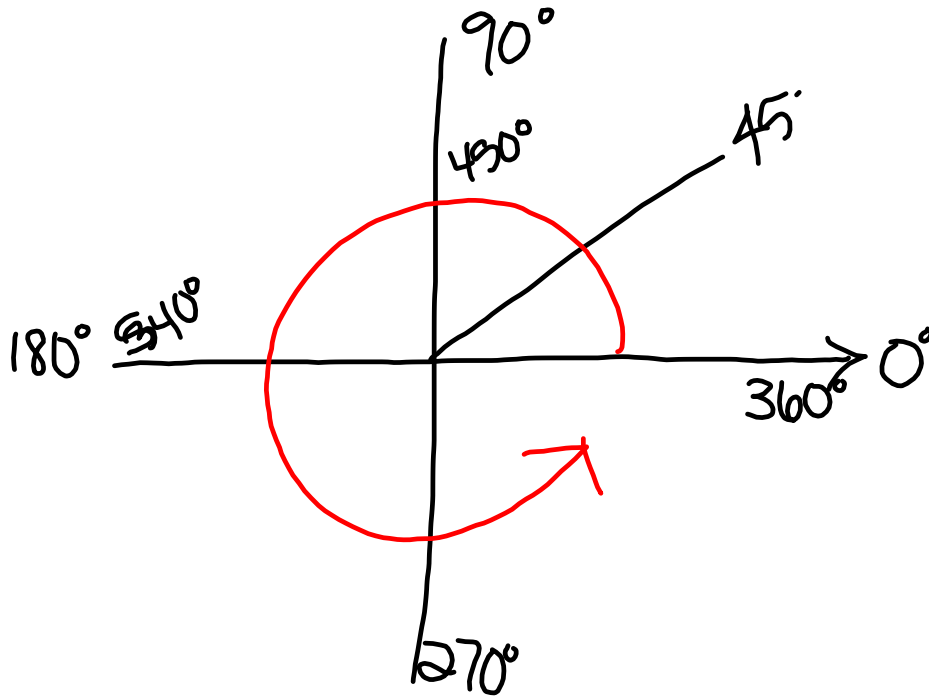
$$y = 41.52 \text{ deg}$$

3. SURVEYING John stands 150 meters from a water tower and sights the top at an angle of elevation of 36° . If John's eyes are 2 meters above the ground, how tall is the tower? Round to the nearest meter.

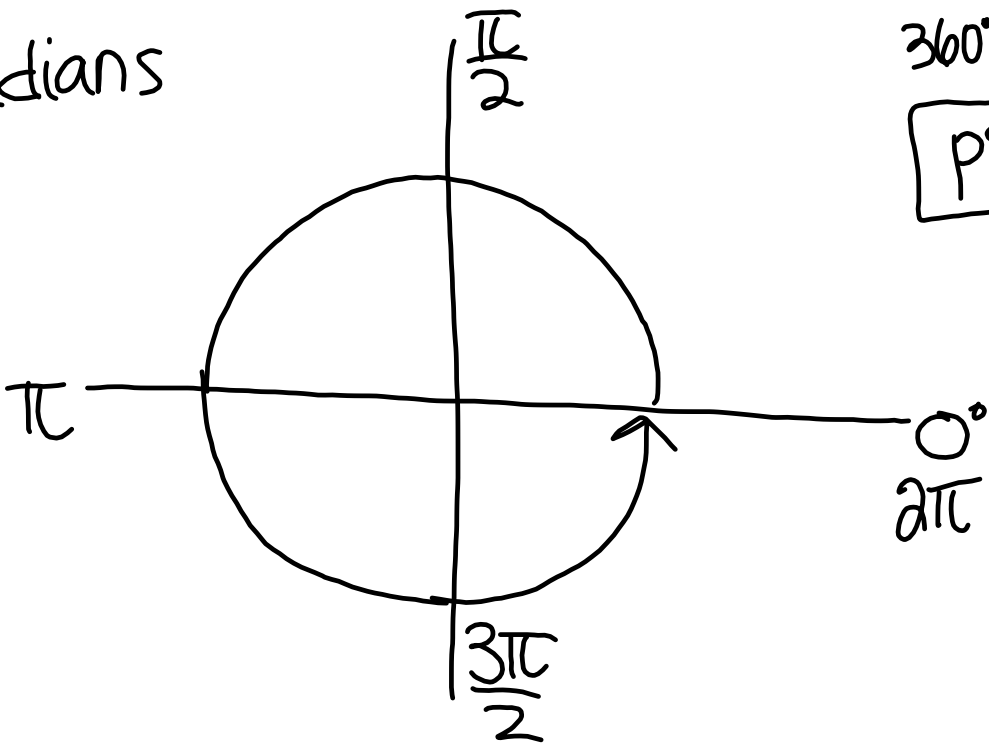
111 meters

LESSON 12-2 Angles and Angle Measure

I can... draw and find angles in standard position and convert between degree and radian measures.



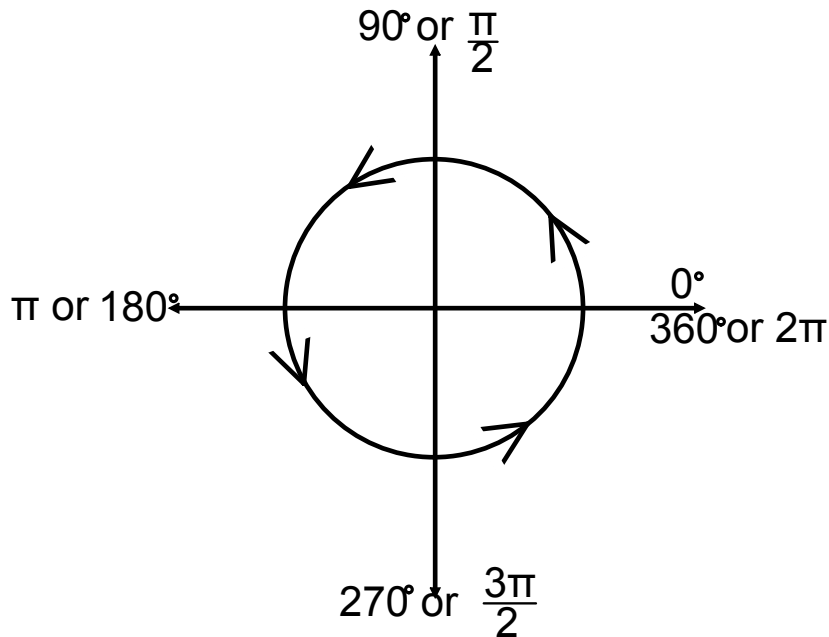
Radians



$$360^\circ = 2\pi$$

P8011

Both



Convert between Radians and Degrees

Degrees to Radians

$$\text{Number of degrees} \times \frac{\pi}{180^\circ}$$

Radians to Degrees

$$\text{Number of radians} \times \frac{180^\circ}{\pi}$$

$$45^\circ \cdot \frac{\pi}{180} = \frac{45\pi}{180} = \frac{\pi}{4}$$

$$\frac{-3\pi}{2} \cdot \frac{180}{\pi} = -270^\circ$$

You Try!

Degrees to Radians

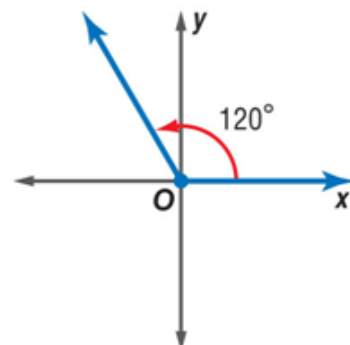
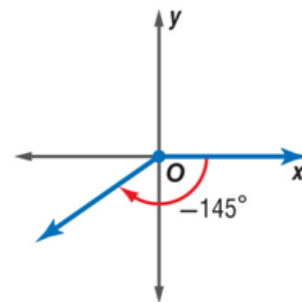
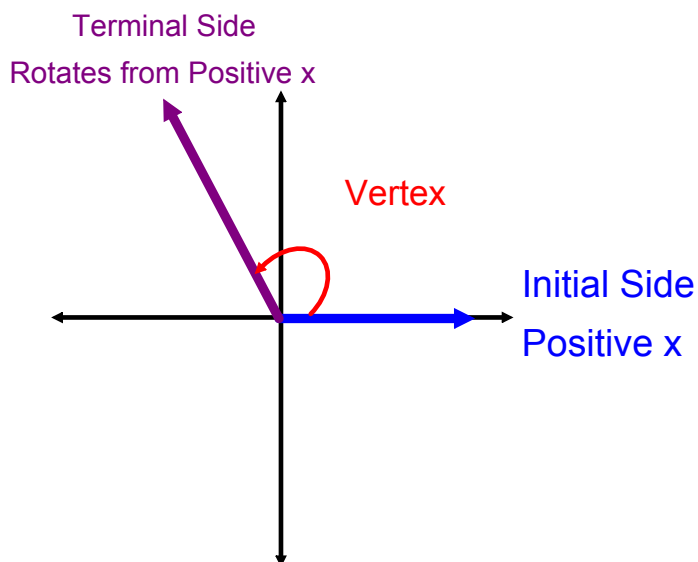
Number of
degrees $\times \frac{\pi}{180^\circ}$

Radians to Degrees

Number of
radians $\times \frac{180^\circ}{\pi}$

1. Rewrite 30° in radians.2. Rewrite $\frac{-5\pi}{3}$ in degrees.

Drawing an angle in standard position.

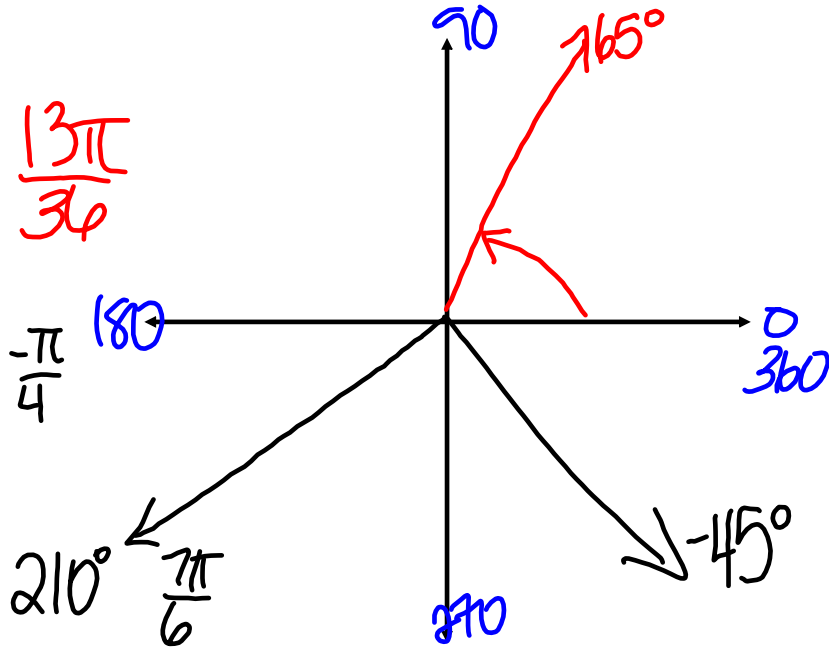


Draw the angles in standard position and convert them to radians.

3. $65^\circ \cdot \frac{\pi}{180} = \frac{13\pi}{36}$

4. $-45^\circ \cdot \frac{\pi}{180} = -\frac{\pi}{4}$

5. $210^\circ \cdot \frac{\pi}{180} = \frac{7\pi}{6}$



Draw the angles in standard position and convert them to degrees.

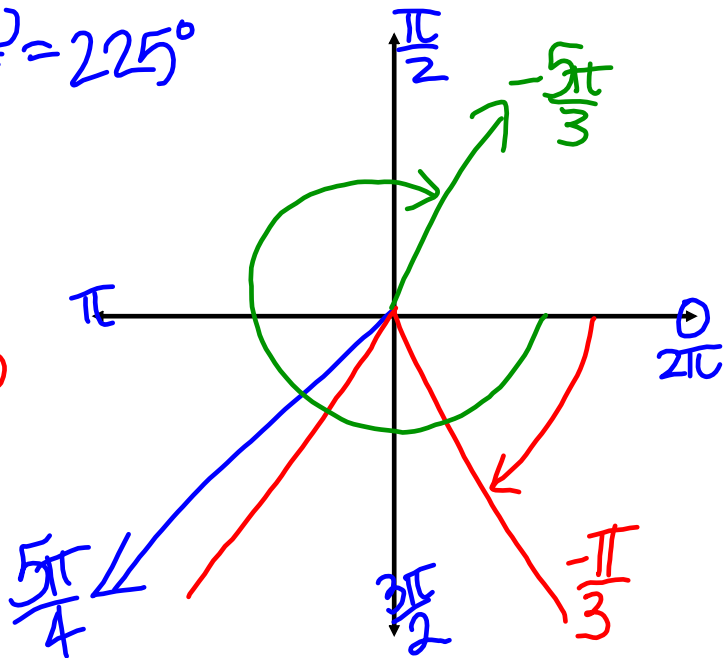
$\frac{5\pi}{4} \cdot \frac{180}{\pi} = 225^\circ$

6. $\frac{5\pi}{4} = \frac{4\pi}{4} + \frac{\pi}{4}$

7. $-\frac{\pi}{3} \cdot \frac{180}{\pi} = -60$

8. $\frac{-5\pi}{3} = \frac{-3\pi}{3} + \frac{-2\pi}{3}$

$-\frac{5\pi}{3} \cdot \frac{180}{\pi} = -300^\circ$

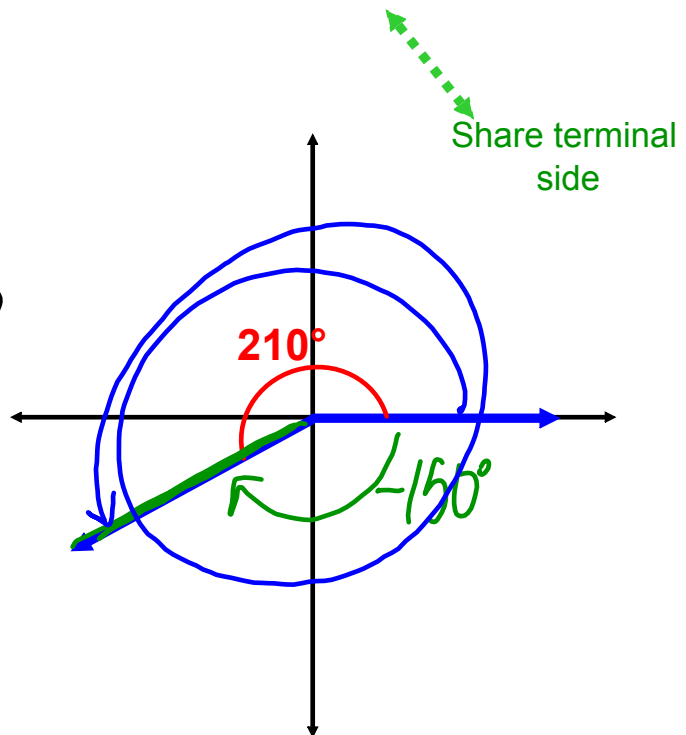


9. Find an angle with a **positive** measure and an angle with a **negative** measure that are coterminal with 210° .

Coterminal:
angles share
the terminal side

$$210 - 360 = -150$$

$$210 + 360 = 570$$

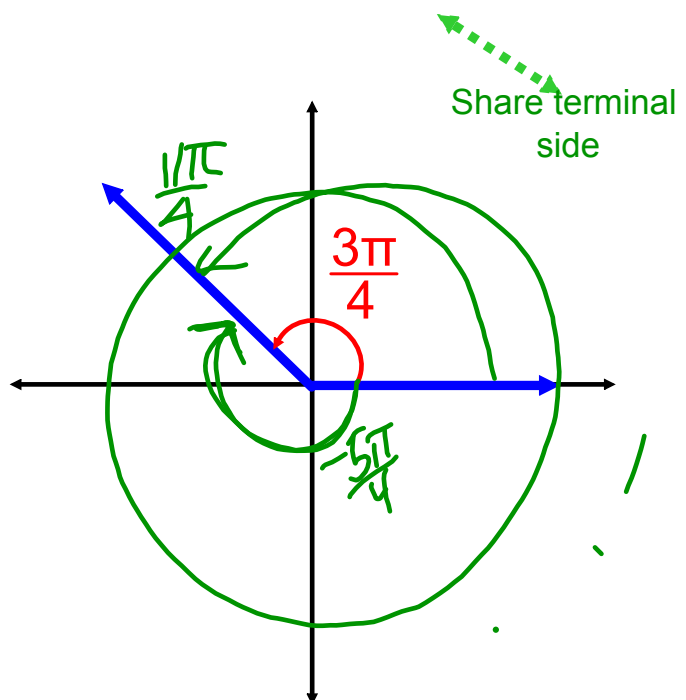


10. Find an angle with a **positive** measure and an angle with a **negative** measure that are coterminal with $\frac{3\pi}{4}$.

$$\frac{3\pi}{4} - 2\pi \cdot 4$$

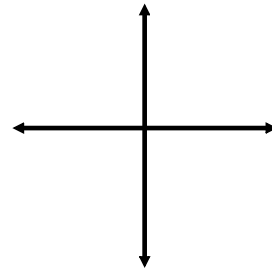
$$\frac{3\pi}{4} - \frac{8\pi}{4} = -\frac{5\pi}{4}$$

$$\frac{3\pi}{4} + \frac{8\pi}{4} = \frac{11\pi}{4}$$



You Try!!

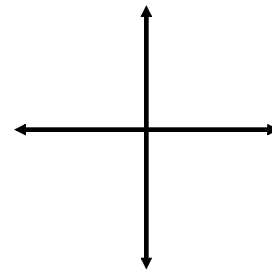
11. Find an angle with a **positive** measure and an angle with a **negative** measure that are coterminal with 330° .



12. Find an angle with a **positive** measure and an angle with a **negative** measure that are coterminal

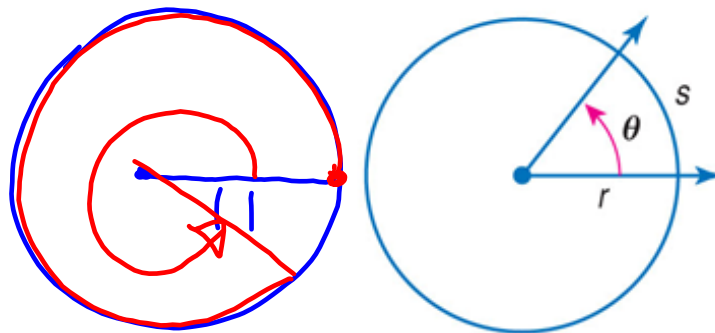
with $-\frac{2\pi}{3}$ $-\frac{6\pi}{3}$

$$\frac{-2\pi}{3} + \frac{6\pi}{3}$$



Arc Length

$$s = r\theta$$



Full Rotation 2π

TRUCKS The steering wheel on a monster truck has a radius of 11 inches. How far does a point on the steering wheel travel if the wheel makes four fifths of a rotation?

$$\theta = \frac{4}{5} \cdot 2\pi$$

$$s = 11 \cdot \frac{4}{5} (2\pi) = 55.29 \text{ in}$$

BOATS The steering wheel on a yacht has a radius of 16 inches. How far does a point on the steering wheel travel if the wheel makes five sevenths of a rotation?

Homework 12.2

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#11-16, 19-30

10, 32, 48