

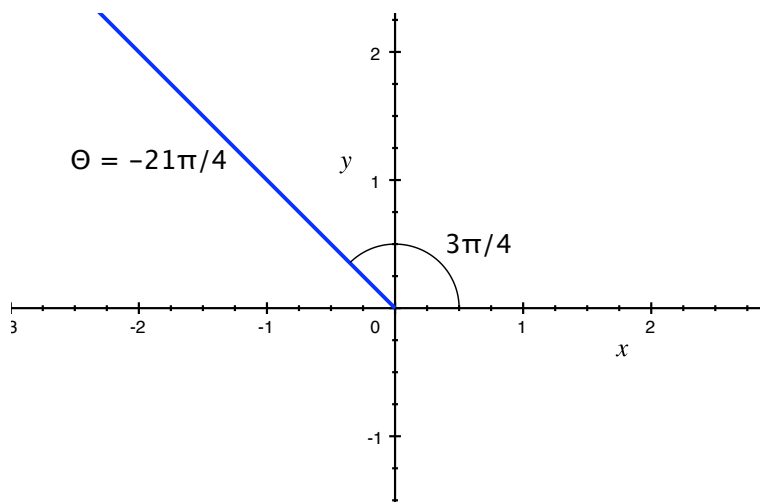
Math 120 Quiz #1 Solutions

1. (3 pts.) Find an angle between 0 and 2π that is coterminal with the angle $-\frac{21\pi}{4}$.

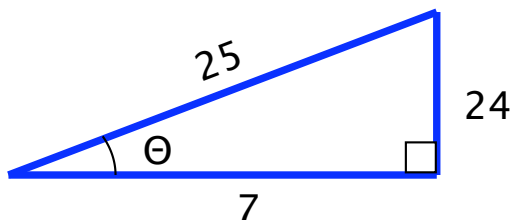
Note that $-\frac{21\pi}{4} = -\frac{20\pi}{4} - \frac{\pi}{4} = -5\pi - \frac{\pi}{4}$.

To find the coterminal angle between 0 and 2π , we add multiples of 2π since $-\frac{21\pi}{4}$ is negative.

By adding 6π we have $-\frac{21\pi}{4} + 6\pi = \frac{3\pi}{4}$, which is between 0 and 2π . So, the coterminal angle is $\frac{3\pi}{4}$ (or 135°).



2. (4 pts.) Sketch a triangle that has acute angle θ given that $\cos \theta = \frac{7}{25}$, and find the other five trigonometric ratios of θ .



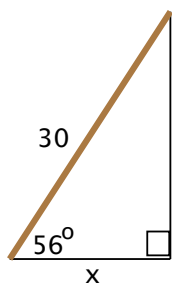
Using the Pythagorean Theorem, we have that the side opposite from θ has length 24.

$$\sin \theta = \frac{24}{25} \qquad \csc \theta = \frac{25}{24}$$

$$\tan \theta = \frac{24}{7} \qquad \cot \theta = \frac{7}{24}$$

$$\sec \theta = \frac{25}{7}$$

3. (3 pts.) A 30-ft ladder leans against a building so that the angle between the ground and the ladder is 56° . How far is the base of the ladder from the wall? (Include units and round your answer to four digits after the decimal.)



$$\cos 56^\circ = \frac{x}{30} \quad \Rightarrow \quad x = 30 \cos 56^\circ \approx 16.7758 \text{ feet}$$

So, the base of the ladder is approximately 16.7758 feet from the wall.