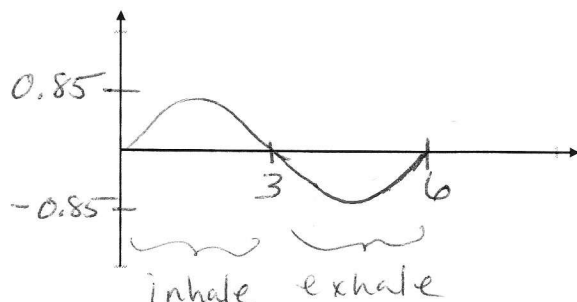


3. The rate of intake during a respiratory cycle for a person at rest is proportional to a sine wave with period six seconds. Suppose the rate is 0.85 liters/sec when $t = 1.5$ sec.

A. Find an equation that describes the rate of intake as a function of time.

$$R(t) = 0.85 \sin\left(\frac{\pi}{3}t\right)$$

B. Graph one cycle of your equation. Indicate the part that corresponds to inhaling. Exhaling.



4. Find the exact value of each. Include a sketch of the angle in standard position.

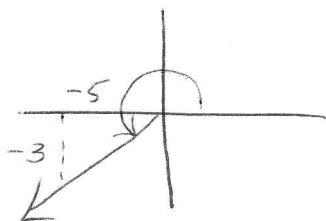
A. $\cos\left(\frac{3\pi}{4}\right) = -\frac{\sqrt{2}}{2}$

or $-\frac{1}{\sqrt{2}}$

B. $\cot\left(\frac{-\pi}{6}\right) = -\frac{1}{\sqrt{3}}$

or $-\frac{\sqrt{3}}{3}$

5. A positive angle A in standard position has its terminal side in Quad III. If $\tan A = \frac{3}{5}$, find $\sin A$.



$$\tan A = \frac{\text{opp}}{\text{hyp}}$$

$$\text{hyp} = \sqrt{9+25} = \sqrt{34}$$

$$\sin A = \frac{-3}{\sqrt{34}}$$

6. Find the exact value for each:

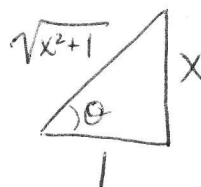
A. $\sec^{-1}(1) = 2\pi$

B. $\sin^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{6}$

7. Simplify each:

A. $\csc^{-1}(\csc x) = x$

B. $\cos(\tan^{-1} x) = \frac{1}{\sqrt{x^2+1}}$



$$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{x}{1}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{1}{\sqrt{x^2+1}}$$