

1. Consider the transformation $y(x) = A \cdot \cos(Bx + C) + D$ where $A, B, C,$ and D are positive constants. How does the value of each constant affect the graph of the standard cosine function. Be specific.

A :

B :

C :

D :

2. The following function describes the air temperature in Fairbanks, Alaska as a function of time. Without graphing the function, determine the period, amplitude, and average value. Include a practical interpretation.

$$T(t) = 37 \sin\left(\frac{2\pi}{365} \cdot t - 1.7386\right) + 25$$

period:

amplitude:

average value:

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.

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. $\cos\left(\frac{3\pi}{4}\right)$

B. $\cot\left(\frac{-\pi}{6}\right)$

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

6. Find the exact value for each: A. $\sec^{-1}(1)$

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

7. Simplify each: A. $\csc^{-1}(\csc x)$

B. $\cos(\tan^{-1} x)$