TRIG FUNCTIONS – PART 1 (1.5) NAME_____

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

**2.** The following function describes the air temperature in Fairbanks, Alaska as a function of time.

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

A. Without graphing this function, determine its period, amplitude, and average value.

B. Graph one period of this function (beginning with $t = 0$).


**3.** The rate of intake during a respiratory cycle (liters/sec) 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. Which part corresponds to inhaling? Exhaling?

**4.** Find the exact value A. $\cos\left(\frac{3\pi}{4}\right)$ B. $\tan\left(\frac{-\pi}{6}\right)$

**5.** An angle $A$ is drawn in standard position with its terminal side in quadrant III.
If $\tan A = \frac{3}{5}$, find the value of $\sin A$.

**6.** Solve for $t$: $\tan(3t) = 1$ where $0 \le t \le \frac{\pi}{2}$.

**7.** Find exact values for each: A. $\cos^{-1}(1)$ B. $\sin^{-1}\left(\frac{1}{2}\right)$

**8.** Simplify each: A. $\sin^{-1}(\sin x)$ B. $\cos(\tan^{-1} x)$