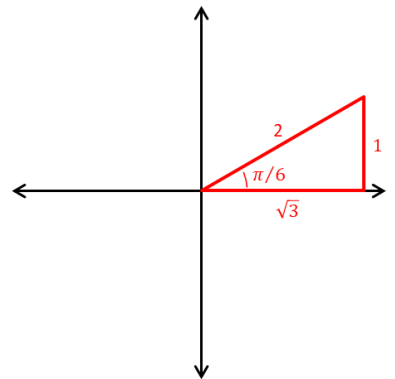


Name _____

1) Find the values of sine and cosine below.

$$\sin\left(\frac{\pi}{6}\right) = \frac{1}{2}$$

$$\cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$$



2) Find the integral below.

$$\int_0^{\frac{\pi}{6}} x \cos(x) dx = x \sin(x) \Big|_0^{\frac{\pi}{6}} - \int_0^{\frac{\pi}{6}} \sin(x) dx = x \sin(x) \Big|_0^{\frac{\pi}{6}} + \cos(x) \Big|_0^{\frac{\pi}{6}} = \frac{\pi}{6} \cdot \frac{1}{2} + \frac{\sqrt{3}}{2} - 0 - 1 = \frac{\pi}{12} + \frac{\sqrt{3}}{2} - 1$$

$$\begin{aligned} u &= x & dv &= \cos(x) dx \\ du &= dx & v &= \sin(x) \end{aligned}$$

3) What is the “Pythagorean identity” involving tangent and secant? You may write your own answer, or select one of the following.

(A) $\sec^2(\theta) + \tan^2(\theta) = 1$

(B) $\sec^2(\theta) - \tan^2(\theta) = 1$

(C) $\sec^2(\theta) - 1 = \tan^2(\theta)$

(D) $\sec^2(\theta) + 1 = \tan^2(\theta)$

(E) All of the above

4) Find the integral below.

$$\int \tan^3(\theta) \sec(\theta) d\theta = \int \tan^2(\theta) \tan(\theta) \sec(\theta) d\theta = \int (\sec^2(\theta) - 1) \tan(\theta) \sec(\theta) d\theta = \int u^2 - 1 du$$
$$\frac{u^3}{3} - u + C = \frac{\sec^3(\theta)}{3} - \sec(\theta) + C$$

$$u = \sec(\theta)$$

$$du = \tan(\theta) \sec(\theta)$$