Pre-Calculus II: Graded Worksheet: Week #2

Due on April 16, 2022 at 11:59pm

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Problem 1

Evaluate each of the following expressions; provide exact values. Be sure to use proper notation to communicate your answers, i.e., link the given expressions and your answers with equal signs. An example has been provided to clarify how your responses should be organized. **[15 points]**

1 Evaluate $\cos\left(\frac{\pi}{3}\right)$ **[1 point]**

$$\cos\left(\frac{\pi}{3}\right) = \frac{1}{2}.$$

2 Evaluate $\sin\left(\frac{5\pi}{6}\right)$ **[1 point]**

$$\sin\left(\frac{5\pi}{6}\right) = \frac{1}{2}$$

.

3 Evaluate $\cos(210^\circ)$ **[1 point]**

$$\cos(210^\circ) = -\frac{\sqrt{3}}{2}.$$

4 Evaluate $\csc(60^\circ)$ **[1 point]**

$$\begin{aligned}\csc(60^\circ) &= \frac{1}{\sin(60^\circ)} \\ &= \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2\sqrt{3}}{3}\end{aligned}$$

.

5 Evaluate $\sec\left(\frac{11\pi}{6}\right)$ **[1 point]**

$$\begin{aligned}\sec\left(\frac{11\pi}{6}\right) &= \frac{1}{\cos\left(\frac{11\pi}{6}\right)} \\ &= \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2\sqrt{3}}{3}\end{aligned}$$

.

6 Evaluate $\tan\left(\frac{5\pi}{4}\right)$ **[1 point]**

$$\begin{aligned}\tan\left(\frac{5\pi}{4}\right) &= \frac{\sin\left(\frac{5\pi}{4}\right)}{\cos\left(\frac{5\pi}{4}\right)} \\ &= \frac{\frac{\sqrt{2}}{-2}}{\frac{\sqrt{2}}{-2}} = 1.\end{aligned}$$

Problem 2

The point A in Figure 1 is specified by $\frac{7\pi}{6}$ on the circumference of a circle of radius 8 units. Use the sin and cos functions to find the **exact** coordinates of point A. **[Be sure to *show* your use of sin and cos.] [3 points]**

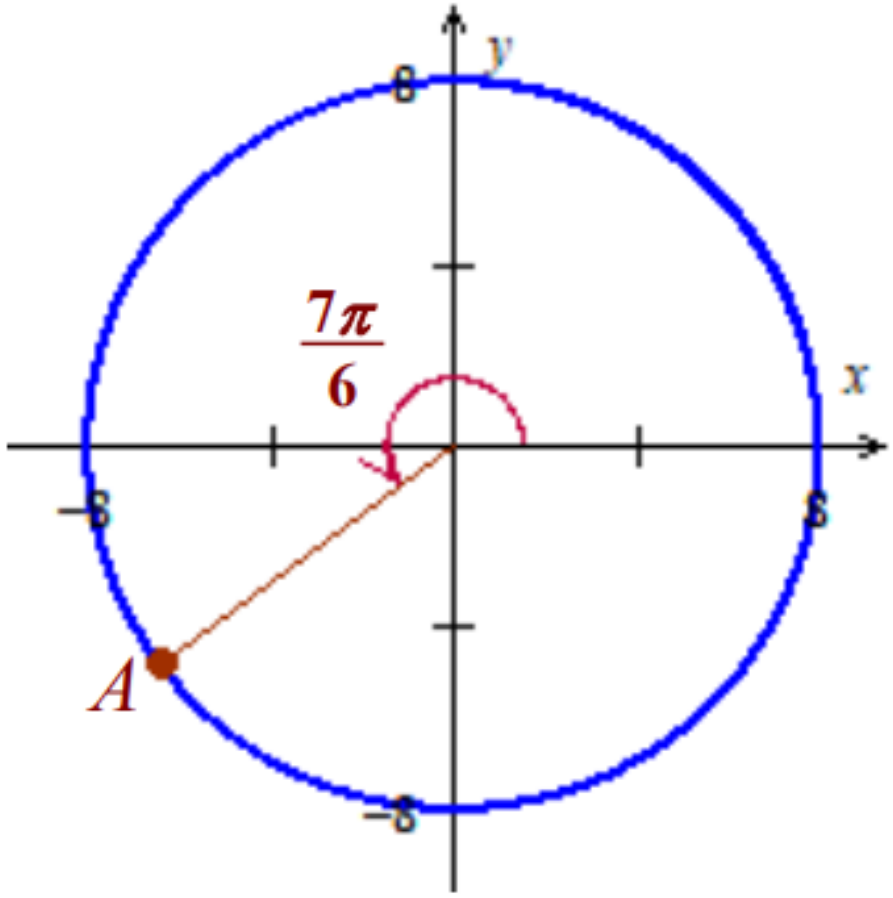

Figure 1

$$\sin\left(\frac{7\pi}{6}\right) = -\frac{1}{2}$$
$$\cos\left(\frac{7\pi}{6}\right) = -\frac{\sqrt{3}}{2}.$$

So, the exact coordinates of point A are:

$$\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$$

.

Problem 3

If $\sin(A) = \frac{5}{6}$ and $\frac{\pi}{2} < A < \pi$ (i.e., angle A is in the second quadrant), find the following **without using any inverse functions**. (Provide **exact** completely simplified numerical answers; as shown above in the example given in #1, use proper notation to **directly communicate** what given expressions equal.) **[6 points]**

$$y = 5$$
$$r = 6$$
$$x = x^2 + 5^2 = 6^2 \implies -\sqrt{11}$$

.

1 $\cos(A)$ **[3 points]**

$$\cos = -\frac{\sqrt{11}}{6}$$

.

2 $\tan(A)$ **[1.5 points]**

$$\tan(A) = \frac{\sin(A)}{\cos(A)} = -\frac{5}{\sqrt{11}}$$

.

3 $\csc(A)$ **[1.5 points]**

$$\csc(A) = \frac{1}{\sin(A)} = \csc(A) = \frac{5}{2}$$

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