### Lesson 11 Practice Problems

1. For which of these angles is the sine negative? Select **all** that apply.
	1. $-\frac{π}{4}$
	2. $-\frac{π}{3}$
	3. $-\frac{2π}{3}$
	4. $-\frac{4π}{3}$
	5. $-\frac{11π}{6}$
2. The clock reads 3:00 p.m.
* Which of the following are true? Select **all** that apply.
* 
	1. In the next hour, the minute hand moves through an angle of $2π$ radians.
	2. In the next 5 minutes, the minute hand will move through an angle of $-\frac{π}{6}$ radians.
	3. After the minute hand moves through an angle of $-π$ radians, it is 3:30 p.m.
	4. When the hour hand moves through an angle of $-\frac{π}{6}$ radians, it is 4:00 p.m.
	5. The angle the minute hand moves through is 12 times the angle the hour hand moves through.
1. Plot each point on the unit circle.
	1. $A=\left(cos\left(-\frac{π}{4}\right),sin\left(-\frac{π}{4}\right)\right)$
	2. $B=\left(cos\left(2π\right),sin\left(2π\right)\right)$
	3. $C=\left(cos\left(\frac{16π}{3}\right),sin\left(\frac{16π}{3}\right)\right)$
	4. $D=\left(cos\left(-\frac{16π}{3}\right),sin\left(-\frac{16π}{3}\right)\right)$
* 
1. Which of these statements are true about the function $f$ given by $f\left(θ\right)=sin\left(θ\right)$? Select **all** that apply.
	1. The graph of $f$ meets the $θ$-axis at $0,\pm π,\pm 2π,\pm 3π,…$
	2. The value of $f$ always stays the same when $π$ radians is added to the input.
	3. The value of $f$ always stays the same when $2π$ radians is added to the input.
	4. The value of $f$ always stays the same when $-2π$ radians is added to the input.
	5. The graph of $f$ has a maximum when $θ=\frac{5π}{2}$ radians.
2. Here is a unit circle with a point $P$ at $\left(1,0\right)$.
* For each positive angle of rotation of the unit circle around its center listed, indicate on the unit circle where $P$ is taken, and give a negative angle of rotation which takes $P$ to the same location.
* 
	1. $A$, $\frac{π}{4}$ radians
	2. $B$, $\frac{π}{2}$ radians
	3. $C$, $π$ radians
	4. $D$, $\frac{3π}{2}$ radians
1. In which quadrant are both the sine and the tangent negative?
	1. first
	2. second
	3. third
	4. fourth
* (From Unit 6, Lesson 6.)
1. *Technology required*. Each equation defines a function. Graph each of them to identify which are periodic. Select **all** that are.
	1. $y=sin\left(θ\right)$
	2. $y=e^{x}$
	3. $y=x^{2}−2x+5$
	4. $y=cos\left(θ\right)$
	5. $y=3$
* (From Unit 6, Lesson 8.)
1. 
	1. List three different counterclockwise angles of rotation around the center of the circle that take $P$ to $Q$.
	2. Which quadrant(s) are the angles $\frac{13π}{4}$ and $\frac{10π}{3}$ radians in? Is the sine of these angles positive or negative?
* (From Unit 6, Lesson 10.)



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