### Lesson 8 Practice Problems

1. A fan blade spins counterclockwise once per second.
* Which of these graphs best depicts the height, $h$, of $P$ after $s$ seconds? The fan blades are 1 foot long and the height is measured in feet from the center of the fan blades.
* 
	1. 
	2. 
	3. 
	4. 
1. Which situations are modeled accurately by a periodic function? Select **all** that apply.
	1. the distance from the earth to the sun as a function of time
	2. the vertical height of a point on a rotating wheel as a function of time
	3. the area of a sheet of paper as a function of the number of times it is folded in half
	4. the number of centimeters in $x$ inches
	5. the height of a swinging pendulum as a function of time
	6. the height of a ball tossed in the air as a function of time
2. Here is the graph of a function for some values of $x$.
* 
	1. Can you extend the graph to the whole plane so that the function $f$ is periodic? Explain your reasoning.
	2. Can you extend the graph to the whole plane so that the function $f$ is not periodic? Explain your reasoning.
	3. Can a non-constant linear function be periodic? Explain your reasoning.
	4. Can a quadratic function be periodic? Explain your reasoning.
1. Do $\left(7,1\right)$ and $\left(-5,5\right)$ lie on the same circle centered at $\left(0,0\right)$? Explain how you know.
* (From Unit 6, Lesson 1.)
1. The measure of angle $θ$ is between 0 and $2π$ radians. Which statements *must* be true of $sin\left(θ\right)$ and $cos\left(θ\right)$? Select **all** that apply.
	1. $cos^{2}\left(θ\right)+sin^{2}\left(θ\right)=1$
	2. If $sin\left(θ\right)=0$, then $cos\left(θ\right)=1$.
	3. If $sin\left(θ\right)=1$, then $cos\left(θ\right)=0$.
	4. $cos\left(θ\right)+sin\left(θ\right)=1$.
	5. The point $\left(cos\left(θ\right),sin\left(θ\right)\right)$ lies on the unit circle.
* (From Unit 6, Lesson 5.)
1. The center of a clock is the origin $\left(0,0\right)$ in a coordinate system. The hour hand is 4 units long. What are the coordinates of the end of the hour hand at:
	1. 3:00
	2. 8:00
	3. 11:00
* (From Unit 6, Lesson 7.)



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