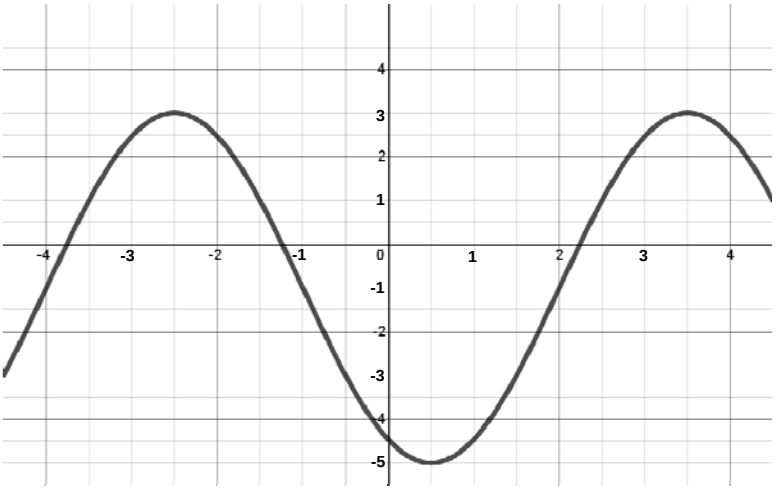
Patterning - Spring
Quiz 7

Name:_____

For each question (except multiple choice and fill in the blank), your solution must show work/calculations and display/explain your reasoning.

1. The following graph is described by a **sine** function.



The midline is y = : _____

The amplitude is: _____

The horizontal shift is: _____
(give the **smallest positive** horizontal shift)

The period is: _____

2. At t = 0 minutes, you are at the very top of a ferris wheel which moves at a constant angular speed. The function $h(t)$ gives your height (in meters) above the ground t minutes after you were at the top: $h(t) = 15\cos\left(\frac{2\pi}{5}t\right) + 18$

a) Determine each of the following (including units):

Amplitude:	Midline:	Period:

b) Determine the following quantities:

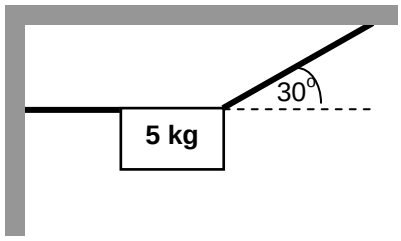
Diameter of ferris wheel, in meters:	Time for one full revolution, in minutes:	Your minimum height above ground when on the ride, in meters:

c) Evaluate $h(2.5)$. What does this quantity mean?

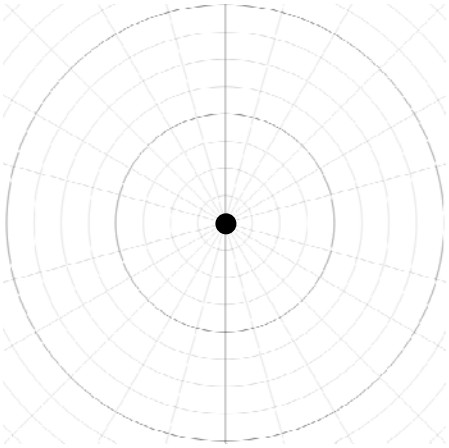
d) When is the first time after $t = 0$ that you are at a height of 15 meters?

e) (continued from previous page) When is the second time after $t = 0$ that you are at a height of 15 meters?

3. A 5 kg block is held by two ropes as shown below.
One rope is at a 30 degree angle, and the other rope is horizontal.



a) Draw a free-body force diagram showing all the forces acting on the block. The dot represents the block. Give each force a useful label. Draw the directions of the forces as carefully as possible (the grid lines are to guide you or you may use your protractor).



b) Rank the magnitude of the forces acting on the block in order from smallest to largest. Indicate any ties with an equals sign.

smallest _____ largest

c) Your goal is to determine the magnitude of the tension in the horizontal rope. Write down some useful equations.

d) Use those equations to determine the magnitude of the tension in the horizontal rope.