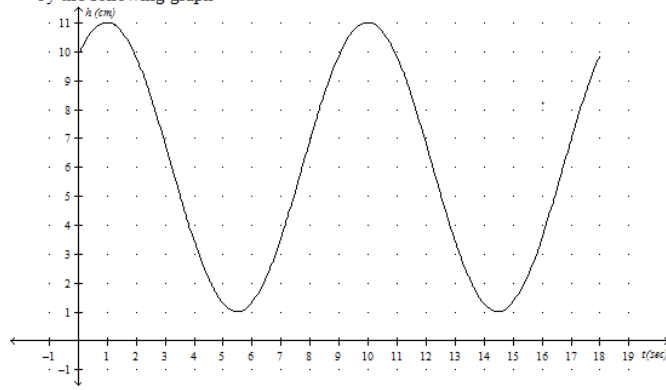


# Review

December-02-13 7:35 AM

- ①. A spring bounces up and down. Its height above the tabletop in terms of time can be represented by the following graph



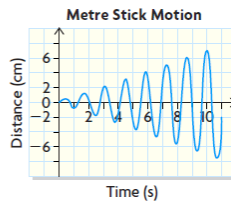
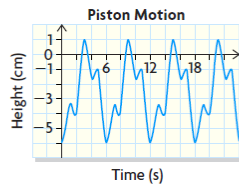
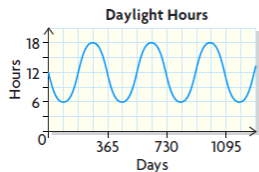
- a) write an equation that will represent this using cosine function.  
 b) use the equation to find the height at 23sec.  
 c) use the equation to find one time when the height is 9cm.

- ②. For  $y = 3\cos(4x + 360^\circ) - 2$  find the following.
- amplitude
  - max and min values
  - phase shift
  - vertical displacement
  - period
  - Sketch
  - state transformations

- ③. A bicycle tire with a diameter of 80cm and that rotates once every 2 sec.
- Sketch one cycle + label 5 points ← assume starts at MAX (do height versus time AND height versus distance)
  - Find equations
  - Find the speed of the bicycle in km/h.

- ④. Determine whether the term *periodic* can be used to describe the graph for each situation. If so, state the period, equation of the axis, and amplitude.

- a) the average number of hours of daylight over a three-year period      b) the motion of a piston on an automated assembly line      c) a student is moving a metre stick back and forth with progressively larger movements



⑤ Find equation using cosine, if possible

a)

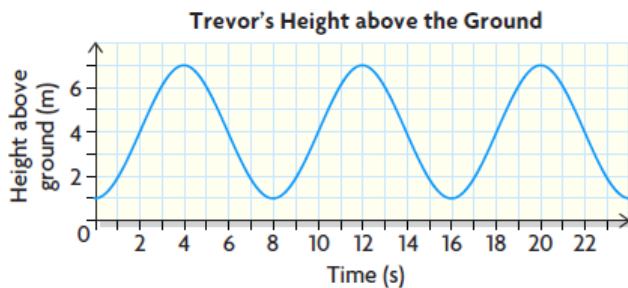
x	y
-5	9
-4	6.75
-3	2.25
-2	0
-1	2.25
0	6.75
1	9

b)

x	y
1	5
2	6
4	5
7	6
11	5
16	6
22	5
29	6

⑥

While riding on a Ferris wheel, Trevor's height above the ground in terms of time can be represented by the graph shown.



- What is the period of this function, and what does it represent?
- What is the equation of the axis? *what does it represent?*
- What is the amplitude + what does it represent?
- Find equation

⑦

Each person's blood pressure is different. But there is a range of blood pressure values that is considered healthy. For a person at rest, the function  $P(t) = -20 \cos(300t)^\circ + 100$  models the blood pressure,  $P(t)$ , in millimetres of mercury at time  $t$  seconds.

- What is the period of the function? What does the period represent for an individual?
- What is the range of the function? Explain the meaning of the range in terms of a person's blood pressure.
- Determine the pressure at 2 sec.
- Find the time(s) at which pressure is 115 mm

8.  $y = 3\cos(4x + 360^\circ) - 2$  represents height in meters of a bucket on a water wheel at  $x$  seconds

- How long does it take for the wheel to make one revolution?
- What is the radius of the wheel?
- Where is the centre of wheel located?

9. The diameter of a car's tire is 60 cm. While the car is being driven, the tire picks up a nail.

- If the speed was 50 km/h draw a sketch of the height versus time for 1 sec.
- Find equation for height versus time.
- Sketch one cycle of height versus distance travelled
- Find equation for height versus distance