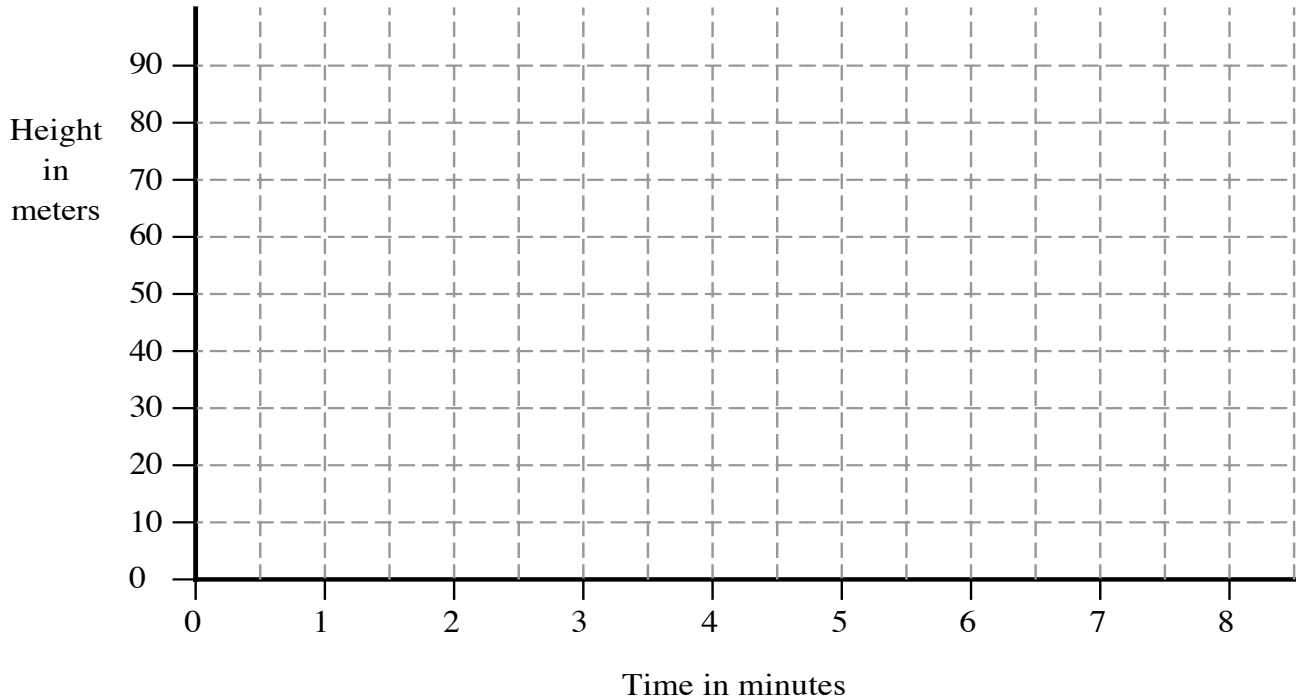# Ferris Wheel

A Ferris Wheel is 60 meters in diameter and rotates once every four minutes.

The center axle of the Ferris Wheel is 40 meters from the ground.

1. Using the axes below, sketch a graph to show how the height of a passenger will vary with time.
    Assume that the wheel starts rotating when the passenger is at the bottom.

Height in meters

Time in minutes

2. A mathematical model for this motion is given by the formula:

    $h = a \cos(b(t-c)+d$ where h = the height of the car in meters
                                        t = the time that has elapsed in minutes
                                        a, b, c, d are constants.
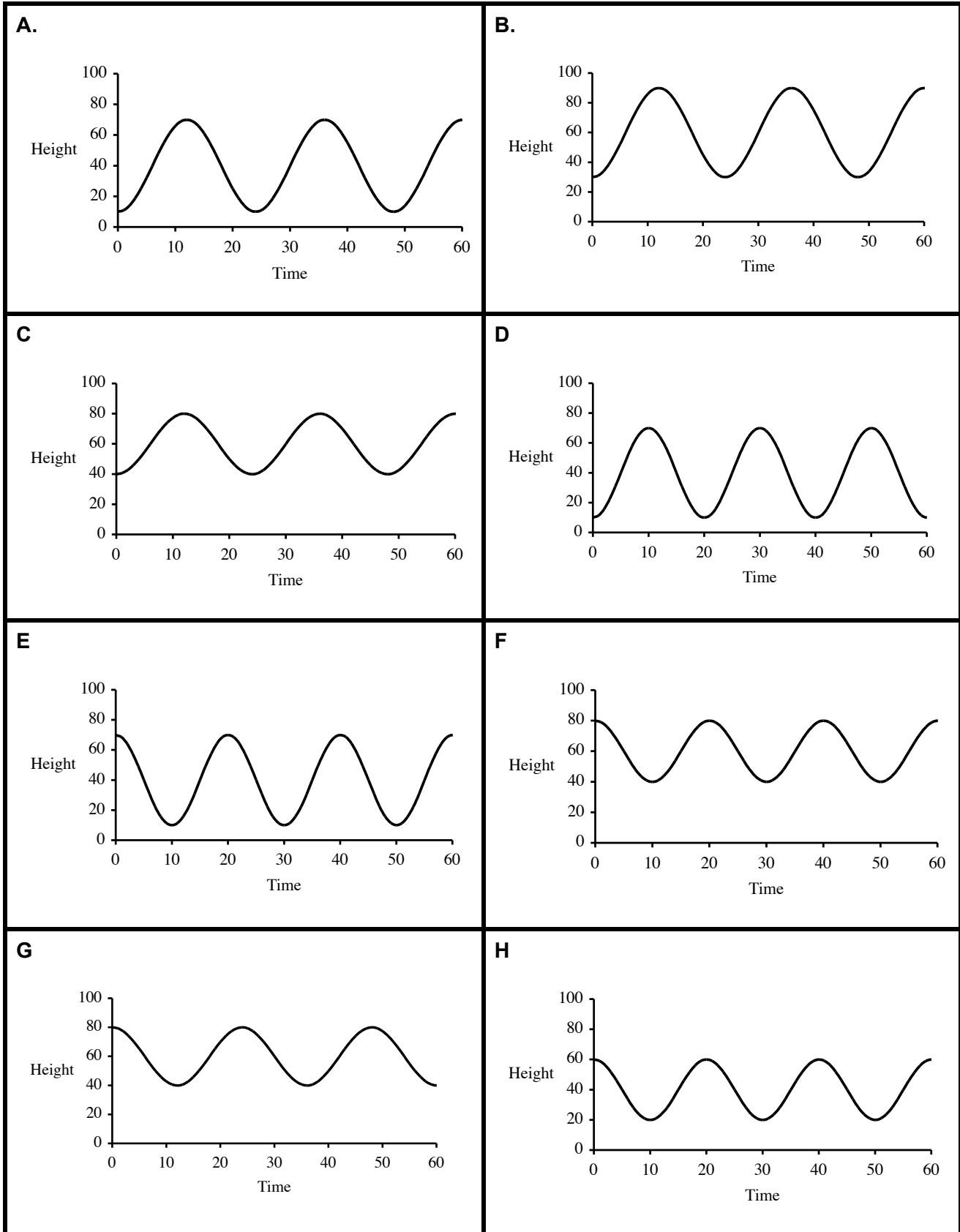
    Write an equation that will model this situation.

Card Set A: Graphs

A.

B.

C

D

E

F

G

H

Card Set B: Functions

1. $$h = 30\cos\left(\frac{\pi}{10}t\right) + 40$$	2. $$h = 20\cos\left(\frac{\pi}{12}t\right) + 60$$
3. $$h = -30\cos\left(\frac{\pi}{10}t\right) + 40$$	4. $$h = -30\cos\left(\frac{\pi}{12}t\right) + 40$$
5. $$h = 20\cos\left(\frac{\pi}{10}t\right) + 60$$	6. $$h = -20\cos\left(\frac{\pi}{12}t\right) + 60$$
7. $$h = 20\cos\left(\frac{\pi}{10}t\right) + 40$$	8. $$h = 20\cos\left(\frac{\pi}{12}(t-12)\right) + 60$$
9. $$h = 30\cos\left(\frac{\pi}{10}(t-10)\right) + 40$$	10. You create the equation.

Card Set C: Descriptions of the wheels

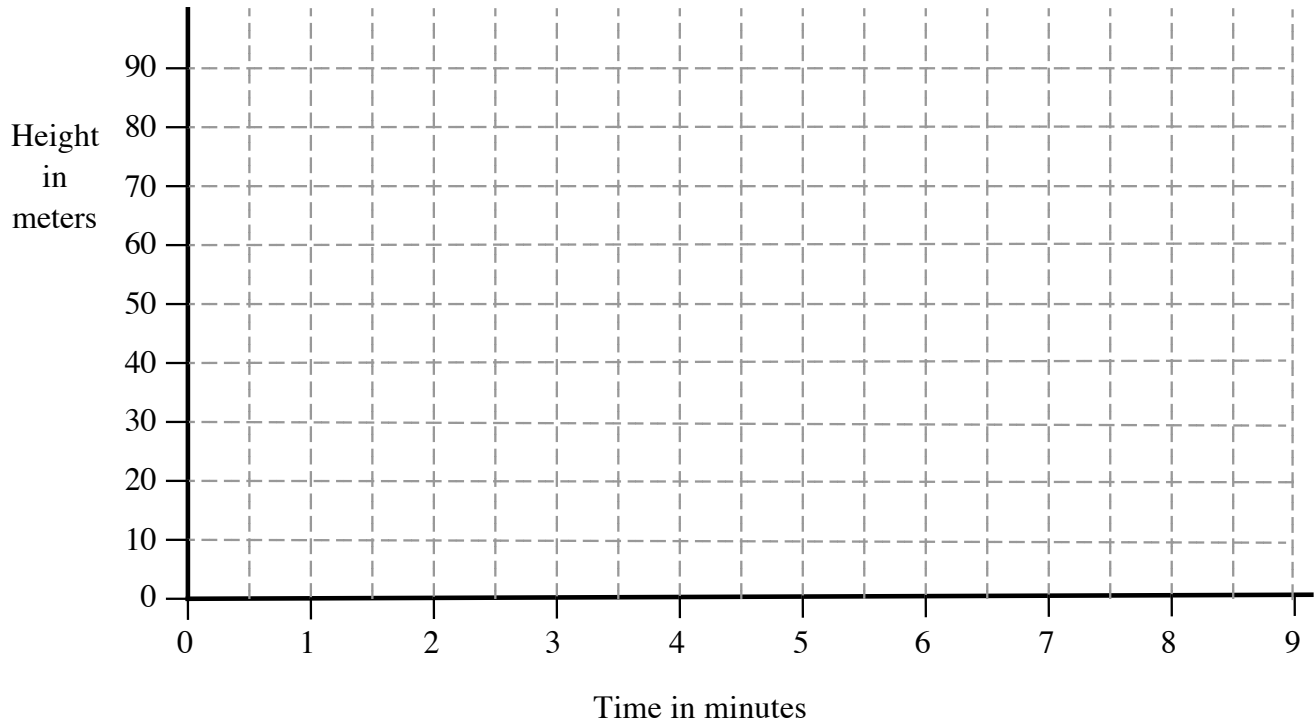|	
1. Diameter of wheel = 40 m Height of axle above ground = 60 m Number of turns per minute = 2.5	**2.** Diameter of wheel = 60 m Height of axle above ground = 60 m Number of turns per minute = 2.5
3. Diameter of wheel = 60 m Height of axle above ground = 40 m Number of turns per minute = 2.5	**4.** Diameter of wheel = 60 m Height of axle above ground = 40 m Number of turns per minute = 3
5 Diameter of wheel = 40 m Height of axle above ground = 40 m Number of turns per minute = 3	**6.** Diameter of wheel = 40 m Height of axle above ground = 60 m Number of turns per minute = 3

Ferris Wheel (Revisited)

A Ferris Wheel is 50 meters in diameter and rotates once every three minutes.

The center axle of the Ferris Wheel is 30 meters from the ground.

1.   Using the axes below, sketch a graph to show how the height of a
      passenger will vary with time.
      Assume that the wheel starts rotating when the passenger is at the
      bottom.

Height in meters (vertical axis, marked 0, 10, 20, 30, 40, 50, 60, 70, 80, 90)
Time in minutes (horizontal axis, marked 0 to 9)

2.   A mathematical model for this motion is given by the formula:

$h = a\cos(b(t-c)+d)$ where h = the height of the car in meters
                                               t = the time that has elapsed in minutes
                                               a, b, c are constants.

      Find values for a, b and c that will model this situation.