The Drop

Suppose a roller coaster ride begins by climbing to a height of 50 meters, stopping briefly, and then falling rapidly to ground level (a height of 0 meters).

As it falls the roller coaster will gain speed.

If you ignore the effects of friction, then height and speed are related by this equation:

$$50 - h = v^2/19.6$$

(h = height in meters, v = velocity in meters per second).

1. Find the missing values in the table below:

h (meters)	v (meters/sec)
15	?
40	?
?	17.1
5	?
?	19.8
?	0.0
25	22.1
?	24.2
?	9.9
?	28.0
0	?

2. a) What is the velocity halfway to the bottom of "The Drop", where h = 25?
   b) What is the velocity at the bottom of the drop, where h = 0?

3. If you made the roller coaster twice as high, do you think the velocity at the bottom be twice as great? Explain your answer.