Projectile Motion (Horizontally Launched)

1. An object is thrown horizontally at a velocity of 10.0 m/s from the top of a 90.0 m building. Calculate the distance from the base of the building that the object will hit the ground.

2. An object is thrown horizontally at a velocity of 25.0 m/s from the top of a 1.50×10^2 m building. Calculate the distance from the base of the building that the object will hit the ground.

3. An object is thrown horizontally at a velocity of 18.0 m/s from the top of a cliff. If the object hit the ground 100.0 m from the base of the cliff, how high is the cliff?

4. An object is thrown horizontally at a velocity of 20.0 m/s from the top of a cliff. If the object hit the ground 48.0 m from the base of the cliff, how high is the cliff?

5. An object is thrown horizontally from the top of a building at a velocity of 15.0 m/s. If the object takes 5.50 s to reach the ground, how high is the building?

6. An object is thrown horizontally from the top of a cliff at a velocity of 20.0 m/s. If the object takes 4.20 s to reach the ground, how far from the base of the cliff did the object hit the ground?

7. An object is thrown horizontally from the top of an 85.0 m building. If the object hits the ground 67.8 m from the base of the building, what was the horizontal velocity of the object?

8. The dots below represent the position of a projectile every 0.10 s as it is projected horizontally to the right along an inclined air table. For this question, consider down and right as the positive directions.
   a) Complete the table.
   b) Using your horizontal velocity, draw a velocity-time graph.
   c) Using your vertical velocity, draw a velocity-time graph.
   d) Using your graphs, find
      i) the horizontal acceleration.
      ii) the vertical acceleration.
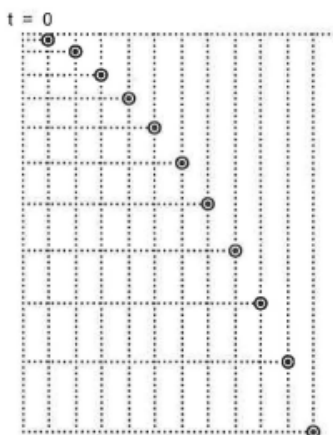
Time (s)	Displacement from t=0 (cm)		Displacement During Time Interval (cm)		Average Velocity During Time Interval (cm/s)	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
0.00	0.00	0.00				
0.10	0.50	0.15				
0.20	1.00	0.30				
0.30	1.50	0.70				
0.40	2.00	1.10				
0.50	2.50	1.60				
0.60	3.00	2.20				
0.70	3.50	2.90				
0.80	4.00	3.70				
0.90	4.50	4.60				
1.00	5.00	5.60				
1.10	5.50	6.70				