Unit 2: Motion

Name: _____ Period: _____ Date: _____

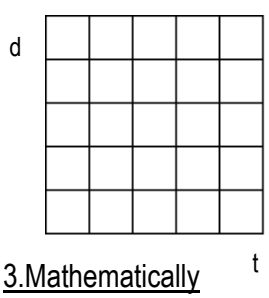
Homework from Textbook:	Due Date
Read Section 4.1; Complete questions on p. 80: 1, 2, 3, 6, 8	
Read Section 4.2; Complete questions on p. 85: 3-6, 8, 9	
Read Section 4.3; Complete questions on p. 93: 3, 4, 5, 7	

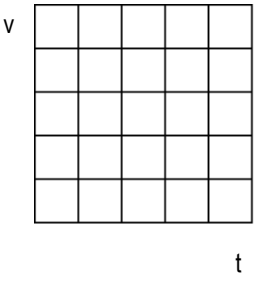
Vocabulary	Description or Definition	Pattern, Diagram, or Equation
Rate		
Speed vs Velocity		
Average Speed		
Instantaneous Speed		
Acceleration		
Free Fall		
cm, m, km		

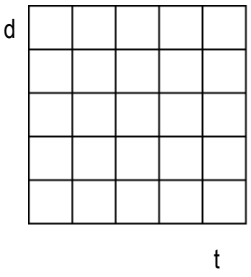
For questions 1 – 4 compete the four representations for the four patterns below.

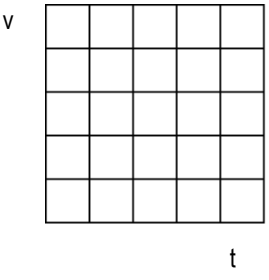
- Constant Velocity- distance vs time Velocity = 5	- Constant Velocity- velocity vs time Velocity = 5	- Constant Acceleration- distance vs time Acceleration = 10	- Constant Acceleration- velocity vs time Acceleration = 10
1a. Pattern:	1b. Pattern:	1c. Pattern:	1d. Pattern:

2. Graphically









3.Mathematically

d = v = d = v =

4. Data Tables:

t	d
1	
2	
5	

t	v
1	
2	
5	

t	d
1	
2	
5	

t	v
1	
2	
5	

5. In words:

Find 2 significant differences between the two d vs t graphs above:

6.

7.

Find 2 significant differences between the two v vs t graphs above:

8.

9.

11. At a high school level, how is the meaning of the slope (rate of change) different in distance versus time compared with velocity versus time graphs?

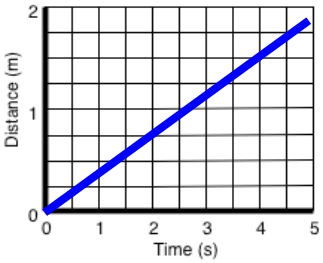
14. Explain at a high school level why a knowledgeable physical science student would not expect a linear relationship on a distance versus time graph for a ball that is speeding up – that is, constantly accelerating.

15. Explain at a high school level why a knowledgeable physical science student would expect a linear relationship on a velocity versus time graph for a ball that is speeding up – that is, constantly accelerating.

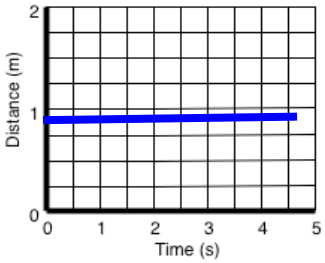
Identify the following d vs t and v vs t graphs as representing motion of

R-Rest CV-F Constant velocity (forward) CV-B Constant velocity (backward)

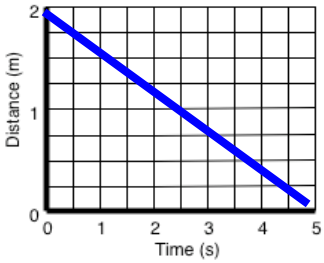
A-SU Accelerating (speeding up) A-SD Accelerating (slowing down)



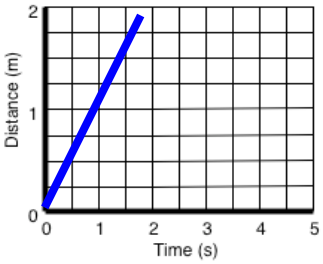
1. Answer : _____



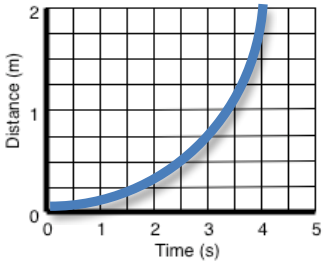
2. Answer : _____



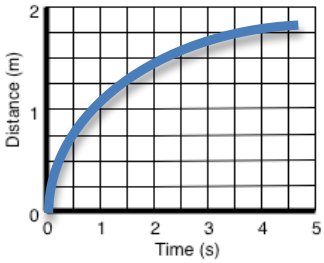
3. Answer : _____



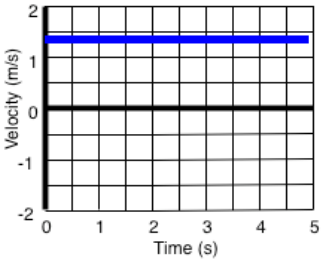
4. Answer : _____



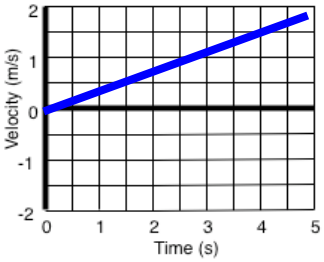
5. Answer : _____



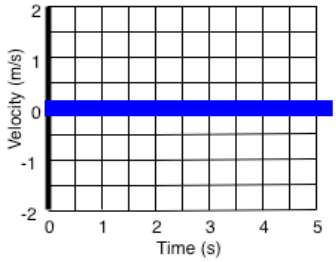
6. Answer : _____



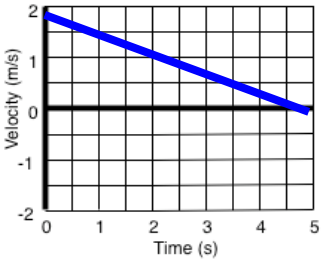
7. Answer : _____



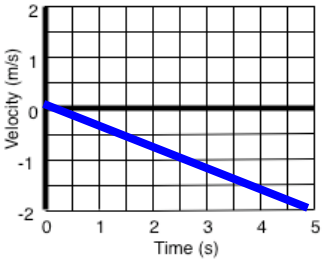
8. Answer : _____



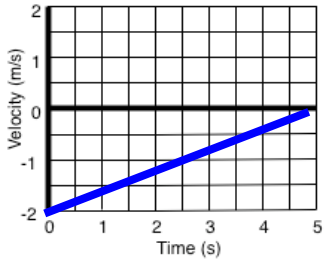
9. Answer : _____



10. Answer : _____



11. Answer : _____



12. Answer : _____

13. At a high school level describe the difference in motion between graphs 1 and 4.

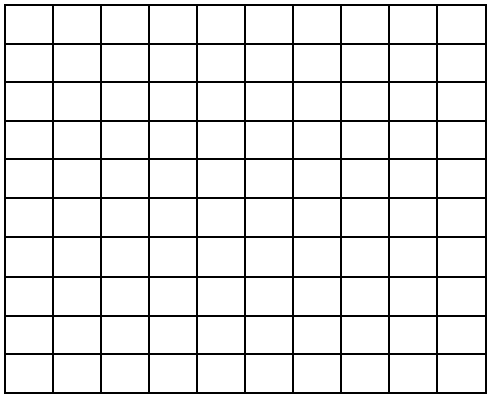
14. At a high school level describe the difference in motion between graphs 1 and 8.

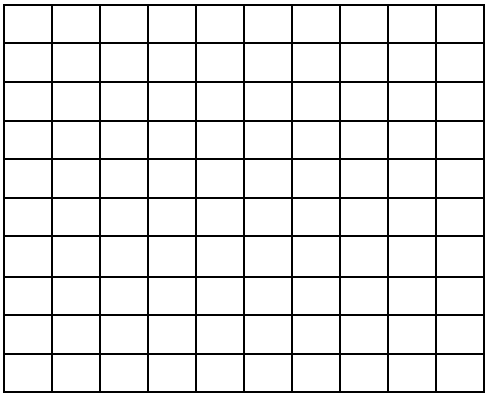
Generating and Analyzing Graphs of Motion

Using the information provided in each problem fill out the data table, graph the time versus distance and the time versus velocity on the graphs provided, and then sketch in your simplest best fit line. Finally answer the questions for each problem:

1. A car moves at a constant velocity of 15.0 m/s.

time (s) +/- 0.2	Distance (m) +/- 1.0	Velocity (m/s) +/- 0.5	Acceleration (m/s^2)
0.0	0.0	15.0	0.0
1.0			0.0
2.0			0.0
3.0			0.0
4.0			0.0





a) Find the slope of the d vs t graph. What does the slope tell you about the motion of the car?

b) Find the slope of the v vs t graph. What does the slope tell you about the motion of the car?

c) Write the equation that represents each graph.

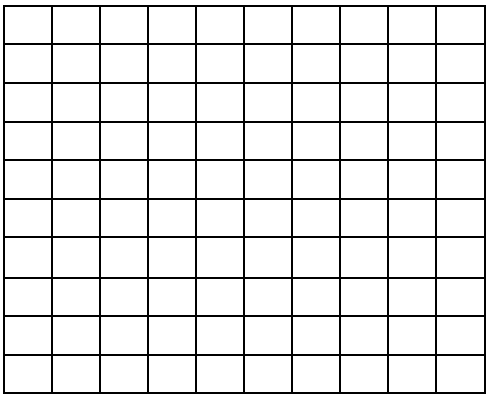
d = v =

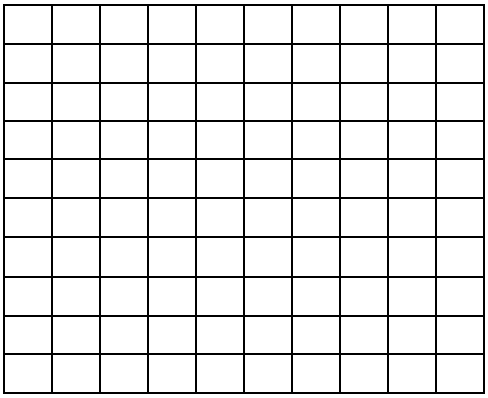
d) What distance and velocity would you predict for this car at a time of 30 seconds?

e) How long will it take the car to travel 6000 m?

2. A golf ball is dropped off the top of the bleachers in free fall. Free fall means the ball accelerates at 10.0 m/s^2 (we will neglect air resistance for this problem).

time (s) +/- 0.2	Distance (m) +/- 1.0	Velocity (m/s) +/- 0.5	Acceleration (m/s^2)
0.0	0.0	0.0	10.0
1.0	5.0	10.0	10.0
2.0			10.0
3.0			10.0
4.0			10.0
5.0	125.0		10.0





a) Find the slope of the v vs t graph. What does the slope tell you about the motion of the rock?

b) What does the y-intercept on the v vs t graph signify?

c) Write the equation that represents each graph

d = v =

d) What distance and velocity would you predict for the rock after it has fallen for 10.0 seconds?