Lesson Summary

When data follow a linear pattern, they can be represented by a linear function whose rate of change can be used to answer questions about the data. When data do not follow a linear pattern, then there is no constant rate of change.

Problem Set

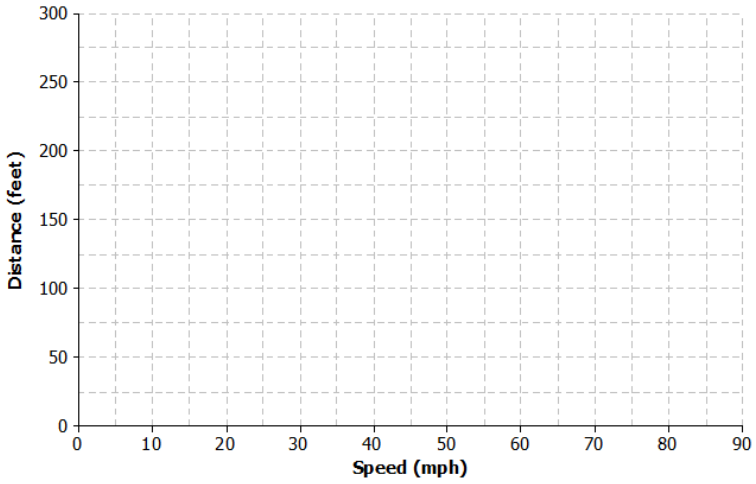
1. Once the brakes of the car have been applied, the car does not stop immediately. The distance that the car travels after the brakes have been applied is called the *braking distance*. The table below shows braking distance (how far the car travels once the brakes have been applied) and the speed of the car.

Speed (miles per hour)	Braking Distance (feet)
10	5
20	17
30	37
40	65
50	105
60	150
70	205
80	265

Data Source: http://forensicdynamics.com/stopping-braking-distance-calculator

(Note: Data has been rounded.)

a. Construct a scatter plot of braking distance versus speed on the grid below.



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b. Find the amount of additional distance a car would travel after braking for each speed increase of 10 mph. Record your answers in the table below.

Speed (miles per hour)	Braking Distance (feet)	Amount of Distance Increase
10	5	–
20	17	
30	37	
40	65	
50	105	
60	150	
70	205	
80	265	

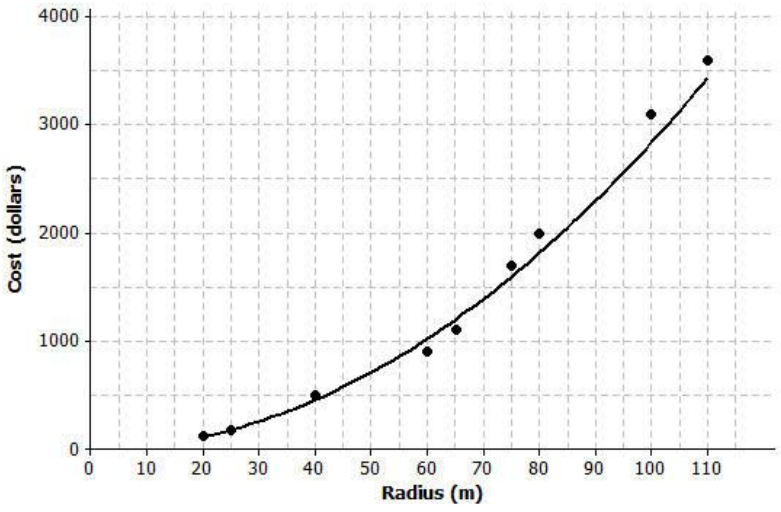
c. Based on the table, do you think the data follow a linear pattern? Explain your answer.

d. Describe how the distance it takes a car to stop changes as the speed of the car increases.

e. Sketch a smooth curve that you think describes the relationship between braking distance and speed.

f. Estimate braking distance for a car traveling at 52 mph. Estimate braking distance for a car traveling at 75 mph. Explain how you made your estimates.

2. The scatter plot below shows the relationship between cost (in dollars) and radius length (in meters) of fertilizing different-sized circular fields. The curve shown was drawn to describe the relationship between cost and radius.



a. Is the curve a good fit for the data? Explain.

b. Use the curve to estimate the cost for fertilizing a circular field of radius 30 m. Explain how you made your estimate.

c. Estimate the radius of the field if the fertilizing cost was $2,500. Explain how you made your estimate.

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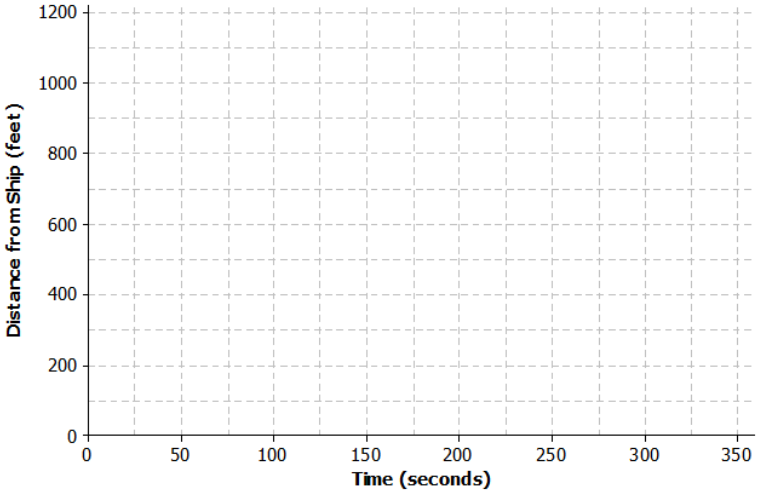
3. Suppose a dolphin is fitted with a GPS that monitors its position in relationship to a research ship. The table below contains the time (in seconds) after the dolphin is released from the ship and the distance (in feet) the dolphin is from the research ship.

Time (seconds)	Distance from the Ship (feet)	Increase in Distance from the Ship
0	0	–
50	85	
100	190	
150	398	
200	577	
250	853	
300	1,122	

a. Construct a scatter plot of distance versus time on the grid below.



b. Find the additional distance the dolphin traveled for each increase of 50 seconds. Record your answers in the table above.

c. Based on the table, do you think that the data follow a linear pattern? Explain your answer.

d. Describe how the distance that the dolphin is from the ship changes as the time increases.

e. Sketch a smooth curve that you think fits the data reasonably well.

f. Estimate how far the dolphin will be from the ship after 180 seconds. Explain how you made your estimate.

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