Chapter 6 Review

6.1 Graphs of Relations

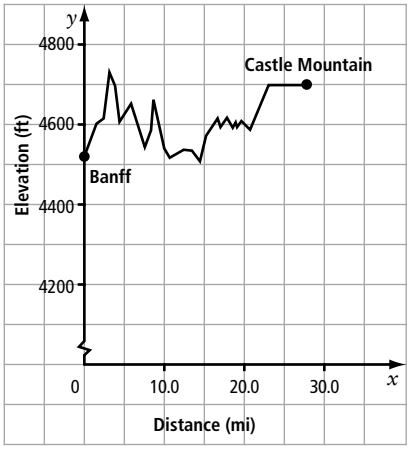
1. Darlene goes to the grocery store. She buys milk, granola, deli ham, bananas, and bread.

a) Draw a map of a grocery store and label the locations of the five items. Draw a dashed line representing the route Darlene would take to pick up these items.

b) What units would best be used to describe Darlene's speed and time as she walks around the store?

c) Draw a graph of Darlene's speed versus time from the time she enters the store until the time she leaves. Be sure to consider any stops she makes or time she spends waiting for service. On your graph, explain each section and label the point on the graph at which each item is picked up.

2. Serge and Colette plan to bike from Banff, Alberta to Castle Mountain along the Bow Valley Parkway. The graph shows the elevation change over the distance of their route.



a) Choose two 5-mile sections of the graph, and describe what the riding might be like in these sections.

b) Which 5-mile section is the easiest? most difficult? Explain your choice.

6.2 Linear Relations

3. For each of the following scenarios, would the graph of the relation be discrete or continuous? Explain.

a) the number of tickets written by a police officer

b) time on the ice during a hockey game for one player

c) number of characters used in a text message

4. Insurance for Priority Mail International parcels is calculated according to this table.

Fee	Insured Amount (not over)
$1.75	$50
$2.25	$100
$2.75	$200
$4.70	$300
$5.70	$400
$6.70	$500
$7.70	$600
$8.70	$675 max

a) Assign a variable to each quantity. Which is independent and which is dependent?

b) Is this relation linear or non-linear? Explain.

c) Graph the relation. Note that one fee charge covers a range of insured amounts.

6.3 Domain and Range

5. State the domain and range of each relation.

a) {(3, −7), (5, 5), (3, −4), (0, 0), (3, 11)}

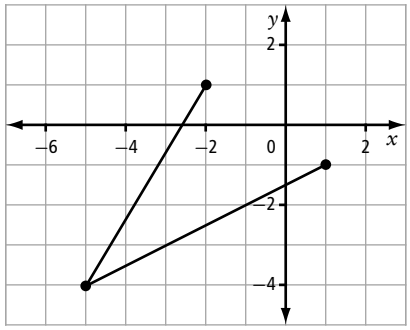
b) All the factors of 10. The answers when the factors are divided back into 10.

6. Change from the given notation to the other notation for each domain given.

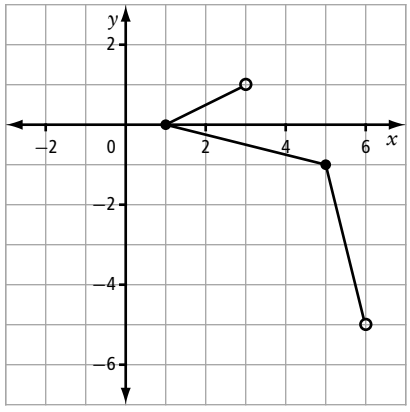
Set Notation	Interval Notation
$\{x \mid 3 < x < 7\}$	
	$[-5, 0]$
$\{x \mid -13 \leq x\ 27\}$	
	$(-\infty, 5]$

7. Provide the domain and range of each relation in set notation.

a)



b)



6.4 Functions

8. Consider the function $f(x) = 2x^2 - 2x + 1$.

a) Calculate $f(0)$.

b) Calculate $f(-1)$.

c) Calculate $f(3)$.

d) Considering that $f(-2)$ and $f(3)$ result in the same value, is $f(x)$ still a function? Explain.

e) Graph $f(x)$. Does the function pass the vertical line test?

9. The formula for the volume of a cube is $V = s^3$. The formula for the volume of a sphere is $V = \frac{4}{3}\pi r^3$.

a) Write each formula in function notation.

b) Complete the table for a sphere that fits exactly inside the given cube.

Side Length of Cube	Volume of Cube	Volume of Sphere
10 cm		
20 cm		
30 cm		
40 cm		

6.5 Slope

10. Find the slope between pairs of points. Before calculating, predict if the slope will be positive, negative, zero, or undefined.

a) P(11, 3), Q(2, 8)

b) M(−6, 0), N(0, 8)

c) J(−3, 5), K(−2, −7)

11. Jordan kept track of all his training distances while bike riding one week in July. His goal was to ride farther each day to build endurance.

	July Date	Distance (km)
Monday	4	60
Tuesday	5	80
Wednesday	6	110
Thursday	7	120
Friday	8	100

a) Plot this data on a graph.

b) Calculate the slopes of the four line segments that connect these points.

c) What does the slope represent?

d) What does a negative slope mean?