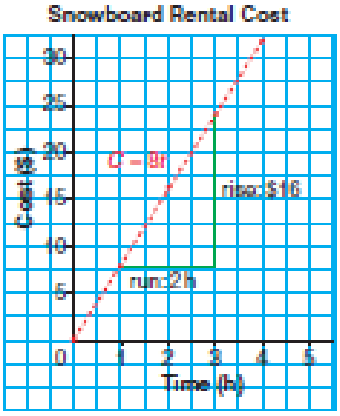
Chapter Review

What Do I Need to Know?

Both direct variation and partial variation are linear relations.

Direct Variation

A graph that represents direct variation is a straight line that passes through the origin.



Time t (h)	Cost C ($)	First Differences
0	0	
1	8	$8 - 0 = 8$
2	16	$16 - 8 = 8$
3	24	$24 - 16 = 8$
4	32	$32 - 24 = 8$

Rate of change $= \frac{\text{rise}}{\text{run}}$

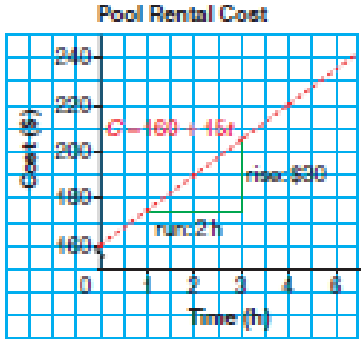
The equation is: $C = 8t$

rate of change is $8/h

Use Frayer models to show what you know about direct variation and partial variation.

Partial Variation

A graph that represents partial variation is a straight line that does not pass through the origin.



Time t (h)	Cost C ($)	First Differences
0	160	
1	175	$175 - 160 = 15$
2	190	$190 - 175 = 15$
3	205	$205 - 190 = 15$
4	220	$220 - 205 = 15$

Rate of change $= \frac{\text{rise}}{\text{run}}$

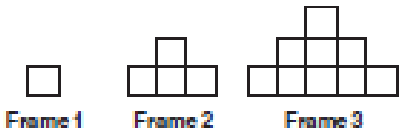
The equation is: $C = 160 + 15t$

fixed cost; variable cost

vertical intercept is $160; rate of change is $15/h

What Should I Be Able to Do?

6.1 **1.** This pattern continues.



a) Sketch the next frame in the pattern.

b) Copy and complete the table below for the first 6 frames.

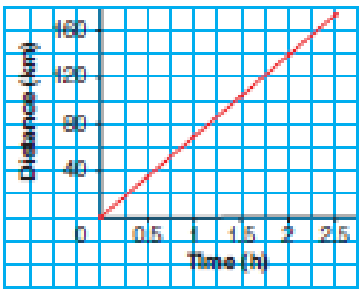
Frame number	Number of squares	First differences
1		
2		
3		

c) Is the relationship linear or non-linear? Explain.

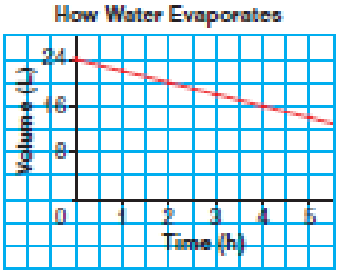
d) Graph the relationship. Does the graph support your answer to part c? Explain.

6.2 6.3 **2.** Determine each rate of change. Explain what it means.

a)



b)



6.4 6.5 **3.** Does each graph in question 2 represent direct variation or partial variation? How do you know?

6.4 **4.** Ken delivers packets of flyers for local stores. His pay varies directly as the number of packets delivered.

Number of packets delivered	0	100	200	300
Pay ($)	0	25	50	75

a) Graph *Pay* against *Number of packets delivered*.

b) Determine the pay for 250 packets delivered.

c) Suppose Ken wants to earn $100. How many packets must he deliver?

d) About how many packets does Ken have to deliver to earn $140?

6.5 **5.** The cost to rent a snowboard for an 8-h day is $28. If the snowboard is kept longer, there is an additional fee per hour.

Number of extra hours	0	1	2	3	4
Rental cost ($)	28	31	34	37	40

a) Graph *Rental cost* against *Number of extra hours*.

b) What does the vertical intercept represent?

c) What is the rate of change? What does it represent?

d) Write an equation to determine the rental cost, C dollars, for t extra hours.

6.6 **6.** To set up a hot air balloon, the crew inflates the balloon with cold air. One fan can blow 450 m^3 of air in 1 min.

a) Make a table of values for the volume, V cubic metres, of air in the balloon when the fan runs for up to 6 min.

b) Graph the data.

c) Write an equation to determine the volume V after t minutes.

d) Another fan can blow only half as much air per minute.

i) How does the graph change? Draw the new graph on the grid in part b.

ii) Write the new equation.

6.7 **7.** Solve each equation. Which tools could you use to help you?

a) $4x + 5 = 9$

b) $3 + 2x = -5$

c) $17 = 5 + 3x$

d) $18 = 3 - 5x$

e) $7x - 6 = 15$

f) $6x + 7 = -23$

6.8 **8.** A small pizza with tomato sauce and cheese costs \$6.00. Each additional topping costs \$0.75.

a) Write a rule for the cost of the pizza when you know how many additional toppings it has.

b) Write an equation for the cost, C dollars, of a small pizza when n toppings are ordered.

c) You have \$10.00 to spend. How many toppings can you order? Use two different methods to find out. Show your work.

6.9 **9.** The length of a person's foot is approximately 15% of his height.

a) What is the approximate foot length of a person who is 180 cm tall?

b) What is the approximate height of a person whose foot is 21 cm long?

c) How can you use an equation to answer these questions?

d) What other methods could you use to answer parts a and b?

6.10 **10.** Jo-Anne is choosing an Internet service provider.

- Speed Dot Company costs \$2.40 for every hour of Internet use.
- Communications Plus costs \$12 per month plus \$0.90 for each hour of Internet use.

a) Write an equation to model the cost for each billing system. Use C to represent the total cost, in dollars, and t to represent the time in hours.

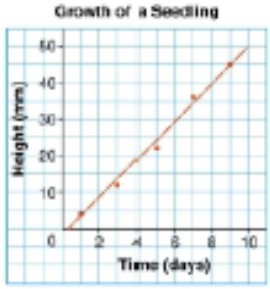
b) Make a table of values up to 10 h for each relationship. Graph both relationships on the same grid.

c) What are the coordinates of the point of intersection? What do they represent?

d) Jo-Anne will use the Internet about 7 h per month. Which company should she choose? Explain your choice.

Chapter 6 Review, page 188

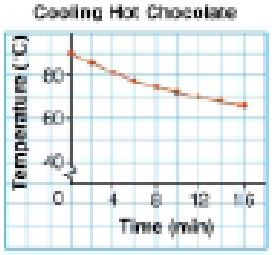
1. a) How the price of a used car changes with age
   b) 3 years
   c) $9000 and $12 000; The $12 000 car may be in better condition, and have less mileage
   d) There is a downward trend; as the age of a car increases, its price decreases.
2. a), b) As the time increases, the height increases.



   c) I) About 18 mm II) 50 mm
   d) About 12 days
   e) No, the seedling will probably not continue to grow at the same rate.
3. a) From 1996 to 1998, sales increased. From 1998 to 2001, sales decreased. From 2001 to 2003, sales decreased very slowly.
   b)

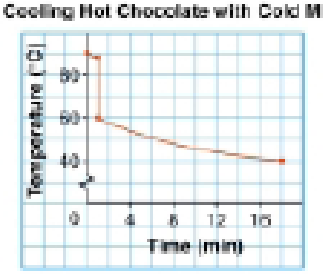
   c) About $1.4 billion, about $950 million
   d) About $940 million; I assume the point lies on the graph that moves down gradually to the right.

4. a) As time increases, the temperature decreases.

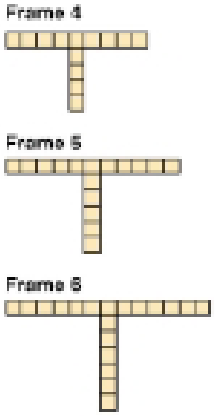


b) A curve of best fit

c) At 1 min, the temperature will suddenly fall, then continue to decrease. Graphs may vary.



5. a)

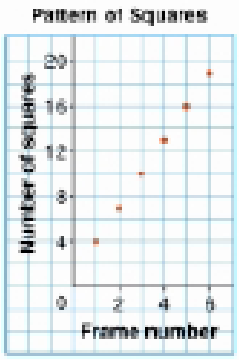


b)

Frame number	Number of squares
1	4
2	7
3	10
4	13
5	16
6	19

c) As the frame number increases by 1, the number of squares increases by 3. I think the graph will be linear.

d)



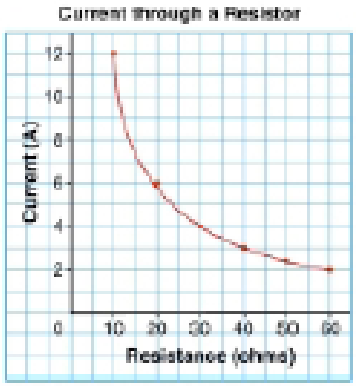
e) The number of squares is 1 more than 3 times the frame number.

f) Extend the table or graph; draw the next 2 frames; or use the rule: 25 squares

g) The 9th frame; I added 3 squares to the 8th frame to get the next frame.

6. a) As the resistance increases, the current decreases.

b)



c) About 8 A

d) About 12 ohms

7. From A to B, Hasleba travels 200 m in 2 min. From B to C, she walks slower and travels 150 m in 4 min. From C to D, Hasleba stops for 4 min. From D to E, Hasleba walks 250 m in 3 min. From E to F, she stops for 3 min. From F to G, Hasleba walks 600 m home in 9 min.

Chapter 6 Practice Test, page 188

1. C
2. C