Day 2 – Pg 174 # 1d, 2d, 3, 4, 6, 9

Practise A

For help with question 1, refer to Example 1.

1. Graph each relation. Determine if the relation is linear, quadratic, or neither.

a)

x	y
−3	−32
−1	−12
1	0
3	4
5	0
7	−12
9	−32

b)

x	y
0	−3
1	5
2	13
3	21
4	29
5	37
6	45

c)

x	y
5	−18
6	−11
7	−10
8	−9
9	−2
10	17
11	54

d)

x	y
2	73
4	97
6	97
8	73
10	25
12	−47
14	−143

e)

x	y
−2	0
−1	−15
0	−16
1	−9
2	0
3	5
4	0

f)

x	y
0	0
1	1
4	2
9	3
16	4
25	5
36	6

For help with question 2, refer to Example 2.

2. Which of these relations are quadratic? How do you know?

a)

x	y
−30	250
−29	241
−28	232
−27	223
−26	214
−25	205
−24	196

b)

x	y
18	0
20	3
22	4
24	4
26	0
28	−5
30	−12

c)

x	y
3	128
6	200
9	288
12	392
15	512
18	648
21	800

d)

x	y
1	2
2	4
3	8
4	16
5	32
6	64
7	128

For help with question 3, refer to Example 3.

3. **a)** Predict which relations are quadratic. Explain your reasoning.

i) $y = 14x^2 - 5x + 7$ **ii)** $y = -8x + 5$

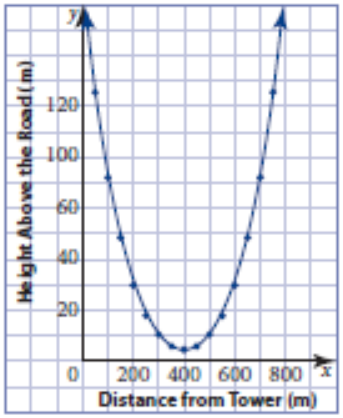
iii) $y = 3x^2 + 2$ **iv)** $y = 2^x$

v) $y = 3 + 2x - 15x^2$ **vi)** $y = 4 + x$

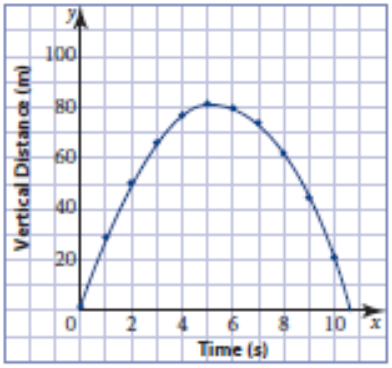
b) Check your predictions by graphing each relation.

4. Does each graph have a maximum or minimum value? Use the graph to estimate the maximum or minimum.

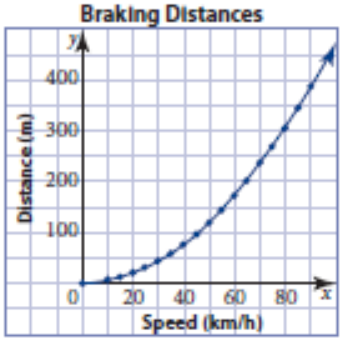
a) **Bridge Cable Height vs Distance**



b) **Bungee Jump**



c) **Braking Distances**



Apply B

5. Bonita and Carl ran a race. They used a CBR™ to measure their distance over time.

Time (s)	0	1	2	3	4	5
Bonita's Distance (m)	0.00	2.50	5.00	7.50	10.00	12.50
Carl's Distance (m)	0.00	0.75	3.00	6.75	12.00	18.75

a) Graph the data for Bonita and Carl on the same set of axes.

b) Which runner's distance–time relationship is quadratic? Explain.

6. A cannonball is shot horizontally from the top of a cliff. Its path can be modelled by the relation $h = 150 - 4.9t^2$, where h is the cannonball's height above the ground, in metres, and t is the time, in seconds.

a) Copy and complete the table.

b) Is the relation quadratic? How do you know?

c) Graph the relation.

Time (s)	Height (m)
0	
1	
2	
3	
4	
5	

9. A farmer wants to use 100 m of fencing to build a small rectangular pen for his llamas. He would like the pen to have the greatest possible area.

a) Copy and complete the table. Provide six possible sets of dimensions for the pen.

Length (m)	Width (m)	Perimeter (m)
40	10	$2(40) + 2(10) = 100$

b) Add a fourth column to the table. Calculate the area of each pen.

c) Draw a graph to compare length and area.

d) Use the graph to determine the dimensions of the pen with the greatest possible area.