

- State the zeros, vertex, and equation of the axis of symmetry of the parabola at the right.
- The points $(-9, 0)$ and $(19, 0)$ lie on a parabola.
 - Determine an equation for its axis of symmetry.
 - The y -coordinate of the vertex is -28 . Determine an equation for the parabola in factored form.
 - Write your equation for part b) in standard form.
- Decide, without graphing, whether each data set can be modelled by a quadratic relation. Explain how you made your decision.

a)

x	-1	0	1	2	3
y	1	2	-3	-14	-31

b)

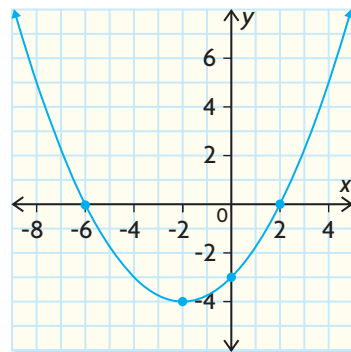
x	0	1	2	3	4
y	-4	-3	0	5	12

- Sketch each graph. Label the intercepts and the vertex using their coordinates.
 - $y = (x - 6)(x + 2)$
 - $y = -(x - 6)(x + 4)$
- The population, P , of a city is modelled by the equation $P = 14t^2 + 820t + 42\,000$, where t is the time in years. When $t = 0$, the year is 2008.
 - Determine the population in 2018.
 - When was the population about 30 000?
- Expand and simplify.
 - $(2x - 3)(5x + 2)$
 - $(3x - 4y)(5x + 2y)$
 - $-5(x - 4)^2$
- A toy rocket is placed on a tower and launched straight up. The table shows its height, y , in metres above the ground after x seconds.

Time, x (s)	0	1	2	3	4	5	6	7	8
Height, y (m)	16	49	72	85	88	81	64	37	0

- What is the height of the tower?
 - How long is the rocket in flight?
 - Do the data in the table represent a quadratic relation? Explain.
 - Create a scatter plot. Then draw a curve of good fit.
 - Determine the equation of your curve of good fit.
 - What is the maximum height of the rocket?
- In what ways is modelling a problem using a quadratic relation similar to using a linear relation? In what ways is it different?
 - Evaluate.

a) 7^{-2} b) -3^0 c) $-\left(\frac{2}{3}\right)^{-4}$ d) -5^{-3}



Process Checklist

- ✓ Question 2: Did you relate the characteristics of the graphical **representation** of the relation with its equation?
- ✓ Questions 5 and 7: Did you select appropriate **problem solving** strategies for each situation?
- ✓ Question 8: Did you make **connections** to **communicate** a variety of ways to relate modelling with linear and quadratic relations?