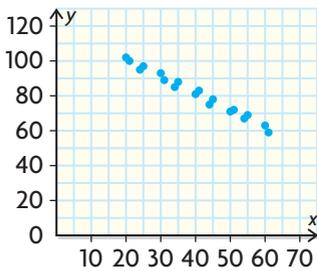


- Write the equation of a linear function that satisfies each set of characteristics.
    - extending from quadrant II to quadrant IV,  $x$ -intercept of 3
    - extending from quadrant III to quadrant I,  $y$ -intercept of  $-6$
  - Repeat part a) for a cubic function.
- Using the equation of each function, determine the possible number of  $x$ -intercepts, the  $y$ -intercept, the end behaviour, the domain, the range, and the possible number of turning points.
  - $f(x) = -(x + 2)^2 + 3$
  - $g(x) = \frac{x + 3}{2}$
  - $h(x) = (x - 7)(x + 2)(x + 3)$
  - $j(x) = -3x^3 + 27x + 2$
- Write the equation of a polynomial function that satisfies each set of characteristics.
  - extending from quadrant II to quadrant IV, two turning points,  $y$ -intercept of  $-6$
  - extending from quadrant III to quadrant IV, degree 2,  $x$ -intercepts of  $-2$  and  $4$



- Describe the characteristics of the graph of each polynomial function.
  - $g(x) = 2(x - 2)^2 + 4$
  - $h(x) = -x^3 + x^2 - x - 1$
- Describe the characteristics of a line of best fit for the scatter plot at the left.
- Toby recorded the following odometer measurements during a single trip in his car:

|                      |   |   |    |    |    |    |    |    |    |
|----------------------|---|---|----|----|----|----|----|----|----|
| <b>Distance (km)</b> | 2 | 5 | 8  | 10 | 11 | 15 | 20 | 30 | 33 |
| <b>Time (min)</b>    | 2 | 6 | 10 | 13 | 14 | 19 | 23 | 35 | 40 |

- Create a scatter plot for the data.
  - Determine the equation of the linear regression function.
  - Use your equation to estimate
    - the time it took for Toby to travel 25 km
    - the possible distance he travelled in 45 min
    - the average speed for the trip
- A spherical balloon is being inflated. The surface area,  $A$ , in square metres, is related to the time,  $t$ , in minutes.

|   |    |    |    |    |     |
|---|----|----|----|----|-----|
| <b>Surface Area, <math>A</math> (m<sup>2</sup>)</b> | 13 | 28 | 50 | 79 | 113 |
| <b>Time, <math>t</math> (min)</b>                   | 0  | 1  | 2  | 3  | 4   |

- Create a scatter plot for the data.
- Determine the quadratic regression function that models the data.
- Use your function to interpolate one value and extrapolate another value.

**WHAT DO You Think Now?** Revisit **What Do You Think?** on page 379. How have your answers and explanations changed?