Prerequisite Skills

Work with Powers

1. Write the base and the exponent of each power.
   a) 2^3
   b) $(-1)^7$
   c) $\left(\dfrac{1}{4}\right)^4$
   d) 6^6

2. Write each product as a single power.
   a) $4 \times 4 \times 4 \times 4 \times 4$
   b) $(-8) \times (-8) \times (-8)$
   c) $3.6 \times 3.6 \times 3.6 \times 3.6 \times 3.6 \times 3.6$
   d) $\dfrac{1}{3} \times \dfrac{1}{3} \times \dfrac{1}{3}$

3. Write each power in expanded form.
   a) 5^6
   b) $(-1)^2$
   c) $\left(\dfrac{9}{10}\right)^4$
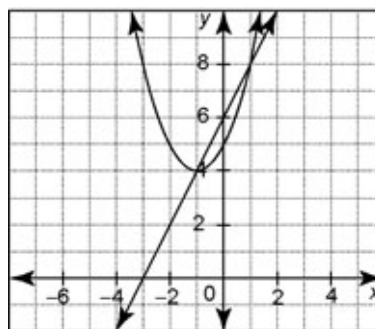   d) $\left(-\dfrac{7}{3}\right)^3$

Graph Linear and Quadratic Relations

4. Graph each relation.
   a) $y = 3x - 2$
   b) $y = (x - 1)^2 - 1$

5. Refer to the graph shown.

   a) Write an equation for the line.
   b) Write an equation for the parabola.
   c) Expand and simplify the equation you found in part b).
   d) Describe in words the transformation the parabola $y = x^2$ underwent to become the parabola shown.

Model Data

6. Carmella recorded the height of a bean plant each week for an eight-week period. The data are shown.

Time (weeks)	Height (cm)
1	1.8
2	2.5
3	3.3
4	3.9
5	4.7
6	5.9
7	6.9
8	7.8

   a) Graph the data.
   b) Which model, linear or quadratic, seems to fit the data better?
   c) Sketch a line or curve of best fit. Then, predict the height of the plant after 10 weeks.

Evaluate Formulas

7. Evaluate each formula for the given values.

   a) $P = 6s$ for $s = 6$ cm

   b) $S = 4\pi r^2$ for $r = 3.1$ m

   c) $A = 0.5Pa$ for $P = 28$ cm and $a = 4$ cm

   d) $C = 2\pi r(1 + r)$ for $r = 2.5$ m

8. a) Given the equation $y = (x - 3)^2 + 1$,
complete the table of values and calculate
the first and second finite differences.

x	y	First Differences	Second Differences
−3			
−2			
−1			
0			
1			
2			
3			

   b) Is the relation linear or quadratic? Justify
your answer.