

## Chapter 1 Prerequisite Skills

1. Determine whether each relation is linear or non-linear. Justify each answer.

a)  $A = \pi r^2$

b)  $y = 5x - 3$

c) (0, 0), (1, 1), (4, 2), (9, 3), (16, 4)

d) (2, 5), (4, 10), (6, 15), (8, 20), (10, 25)

2. Christina writes the following number pattern: 9, 16, 23, ...

- a) Create a table of values for the first five terms.

- b) Develop an equation that can be used to determine the value of each term in the number pattern.

- c) What is the value of the 71st term?

- d) Which term has a value of 135?

3. Julian creates a number pattern that starts with the number -4. Each subsequent term is 5 less than the previous term.

- a) Create a table of values for the first five numbers in the pattern.

- b) What equation can be used to represent the pattern? Verify your answer by substituting a known value into your equation.

- c) What is the value of the 49th term?

- d) Which term has a value of -89?

4. Create a graph and a linear equation to represent each table of values.

a)

$x$	$y$
-3	-8
-2	-5
-1	-2
0	1
1	4
2	7
3	10

b)

$x$	$y$
12	2
15	3
18	4
21	5
24	6
27	7
30	8

5. Express each equation in slope-intercept form.

a)  $2x + y = 6$

b)  $3x + y + 9 = 0$

c)  $5x + 6y = 8$

d)  $6x - y = 4$

e)  $7x - y + 9 = 0$

f)  $8x - 4y = 3$



6. What is the value of each expression?

a)  $5^3$

b)  $(-6)^4$

c)  $\left(\frac{1}{2}\right)^4$

d)  $\left(-\frac{2}{3}\right)^2$

7. Evaluate.

a)  $\sqrt[3]{-8}$

b)  $\sqrt[4]{81}$

c)  $\sqrt{\left(\frac{1}{9}\right)}$

d)  $\sqrt[5]{\left(-\frac{32}{243}\right)}$

8. Simplify each expression by rewriting it using positive exponents only.

a)  $\frac{12^3}{12^7}$

b)  $\frac{1}{s^2t^{-3}}$

c)  $\frac{8t}{t^{-3}}$

d)  $\left[(xy^5)^{-3}\right]^{-2}$

9. Protactinium has a half-life of 2 min.

Suppose a sample of protactinium has a mass of 1000 g. The formula for the mass of protactinium remaining after  $n$  2-min

intervals is  $A = 1000\left(\frac{1}{2}\right)^n$ .

a) Create a table of values showing the amount of protactinium remaining after the first five 2-min intervals.

b) How long would it take for the sample to be reduced to  $\frac{1}{64}$  th its original size?

