

4.1: Writing Equations to Describe Patterns Worksheet

1. In each equation, determine the value of A when n is 3.

a) $A = 2n + 1$

$$\begin{aligned} &= 2(3) + 1 \\ &= 6 + 1 \\ &= 7 \end{aligned}$$

b) $A = 3n - 2$

$$\begin{aligned} &= 3(3) - 2 \\ &= 9 - 2 \\ &= 7 \end{aligned}$$

c) $A = 4n + 3$

d) $A = 3n - 2n$

2. The pattern in this table continues. Which equation below relates the figure number n , to the perimeter of the figure P ? (multiple choice question)

$$P = 3n + 4$$

Figure Number, n	Perimeter, P
1	7
2	10
3	13
4	16

3
3
3
3
↑

Numerical
Coefficient

a) $P = 3n + 7$

b) $P = 7n + 3$

c) $P = 3n + 4$

d) $n = 3P + 7$

3. The pattern in each table below continues. For each table:
- Using words describe the pattern that relates v to t .
 - Write an **equation** that relates v to t .
 - Verify your equation by substituting values from the table.

a)

Term Number, t	Term Value, v
1	8
2	13
3	18
4	23

i) the term value is five times the term number plus 3.

ii) $v = 5t + 3$

iii) $v = 18 \rightarrow t = 3$

$$v = 5(3) + 3$$

$$= 15 + 3$$

$$= 18$$

b)

Term Number, t	Term Value, v
1	34
2	31
3	28
4	25

i) the term value is 37 subtract three times the term #.

ii) $-3t + 37 = v$ or $v = 37 - 3t$

iii) $t = 4$ $v = 25$

$$v = 37 - 3(4)$$

$$= 37 - 12$$

$$= 25$$

4. Rachel takes care of homes during the summer while their owners are away on vacation. She charges \$8, plus \$2.50 a day.

- a) Create a table that shows the charges when the owners are away for up to 5 days.

# of days n	Cost C
1	$8 + 2.50 = 10.50$
2	$8 + 2(2.50) = 13.00$
3	$8 + 3(2.50) = 15.50$
4	$8 + 4(2.50) = 18.00$
5	$8 + 5(2.50) = 20.50$

- b) Write an equation that relates the charge, C dollars, to the number of days, n , that the owners are away.

$$C = 2.50n + 8$$

- c) What will the charge be when the owners are away for 14 days?

$n = 14$ $C = 2.50(14) + 8$

$$= 35 + 8$$

$$= 43$$

- d) How many days were the owners away when the charge was \$33?

$$33 = 2.50n + 8$$

$$25 = 2.50n$$

$$\frac{25}{2.50} = \frac{2.50n}{2.50}$$

$$n = 10$$

