1. Tommy uses multilink cubes to represent an unknown number and base ten ones to represent 1.

\[ \text{block} = x \quad \text{red} = 1 \]

Write algebraic expressions to describe the sets of cubes. The first one has been done for you.

a) 

\[ 2x + 3 \]

b) 

\[ 3x + 5 \]

c) 

\[ 3x \]

d) 

\[ x + 3 \]

e) 

\[ 2x + 5 \]

f) 

\[ 5x + 2 \]

g) 

\[ 2x + 6 \]

h) 

\[ 4x + 9 \]

2. Use Tommy’s method to represent these expressions.

a) \( x + 2 \)

b) \( 2x \)

c) \( 3x + 1 \)

d) \( x + 6 \)

Compare answers with a partner.

3. Use cubes to help you simplify the following expressions. The first one has been done for you.

a) \( 2y + 5 + y \)

\[ \text{cubes} \]

\[ 3y + 5 \]

b) \( 3a + 2 + a + a \)

\[ \text{cubes} \]

\[ 5a + 9 \]

c) \( 6p + 2 - 2p \)

\[ \text{cubes} \]

\[ 4p + 2 \]

d) \( m + 4 + 3m - 3 \)

\[ \text{cubes} \]

\[ 4m + 1 \]

4. Complete the function machines.

a) 

\[ \text{input} \rightarrow +4 \rightarrow \text{output} \]

\[ \begin{array}{c}
\text{input} \\
2 \\
7 \\
y \\
\end{array}
\begin{array}{c}
\text{output} \\
6 \\
11 \\
y + 4 \\
\end{array} \]

b) 

\[ \text{input} \rightarrow \times 2 \rightarrow \text{output} \]

\[ \begin{array}{c}
\text{input} \\
2 \\
7 \\
y \\
\end{array}
\begin{array}{c}
\text{output} \\
4 \\
10 \\
2y \\
\end{array} \]
5 Match each statement to the equivalent algebraic expression. Write the missing statements.

- 5 more than $y$  $2y$
- $y$ less than 5  $y - 5$
- $y$ multiplied by 5  $5 - y$
- $y$ divided by 5  $y + 5$
- Double $y$  $5y$
- 5 less than $y$  $y^2$
- $y$ multiplied by $y$  $\frac{y}{5}$

6 Write an algebraic expression to represent the perimeter of each shape.

- a) $3a$
- b) $4b$
- c) $3x + 2y$
- d) $2a + 2b$

7 Complete the bar models.

- a) $2a$
- b) $2b + 10$
- c) $c$
- d) $d + 5$