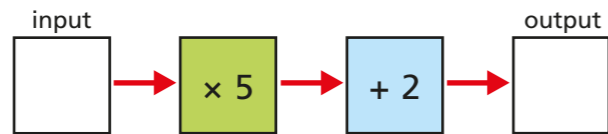


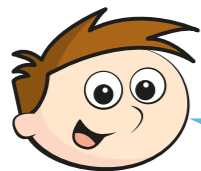
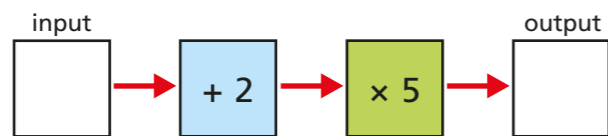
Find a rule – two step

1 Use the function machine to complete the table.



Input	1	2	3	5	10	50
Output						

2 Here is the same function machine with the steps in the reverse order.



The outputs will be the same.

Teddy



The outputs will be different.

Jack

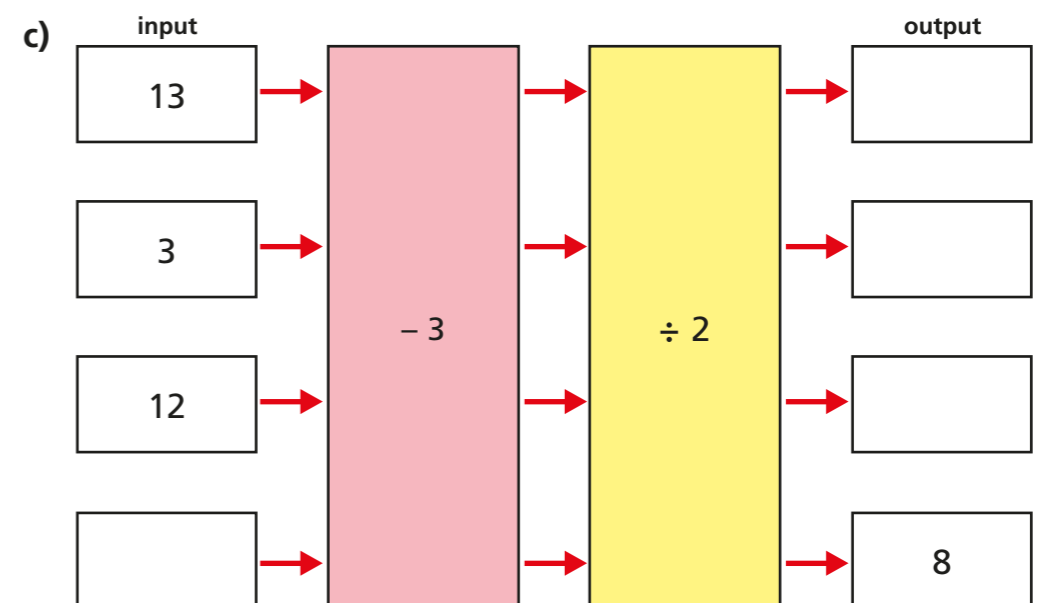
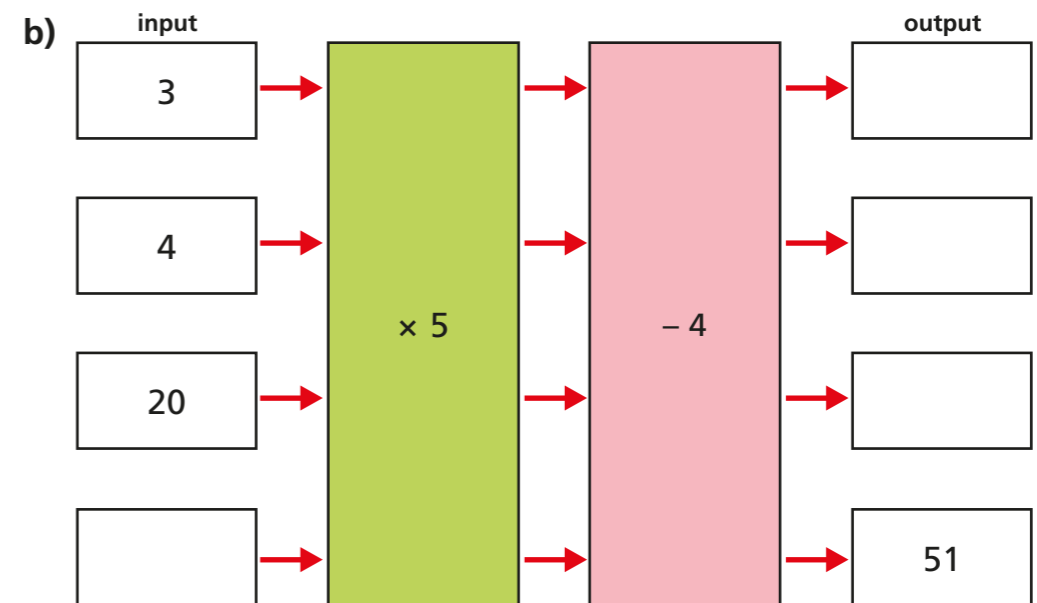
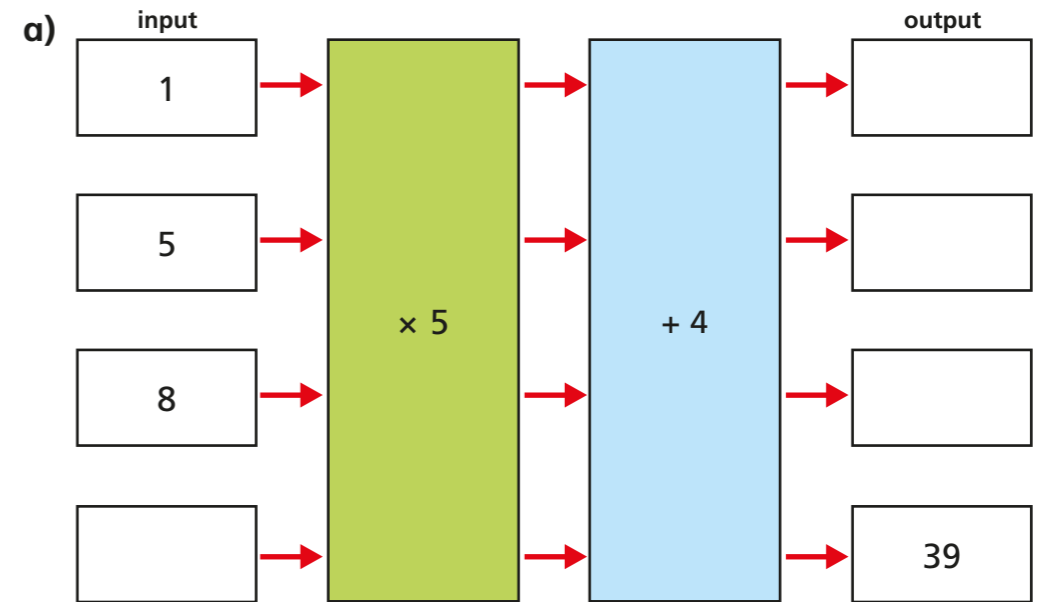
Explain to a partner who you think is correct.

Use the function machine to complete the table.

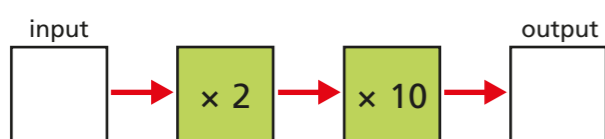
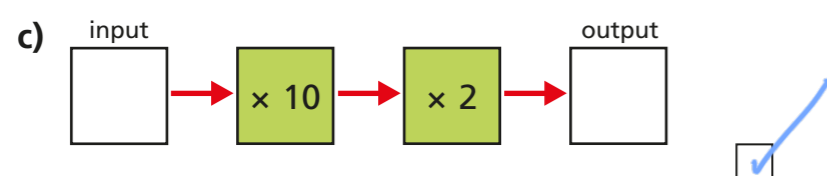
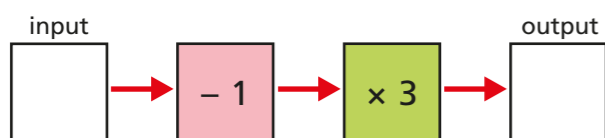
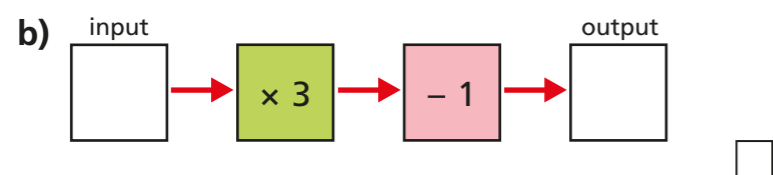
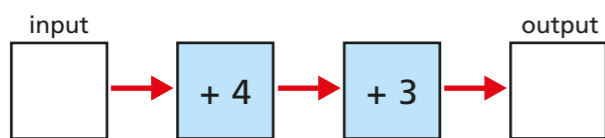
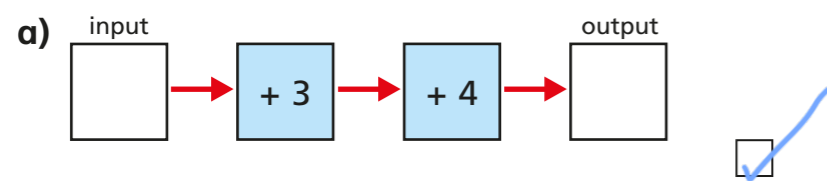
Input	1	2	3	5	10	50
Output						

Who is correct? _____

3 Work out the missing outputs and inputs.



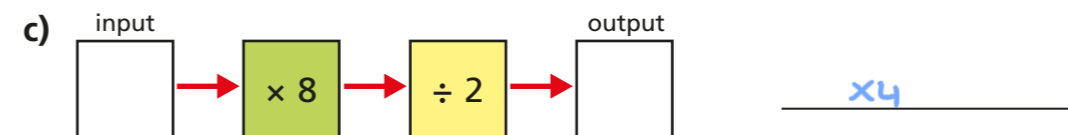
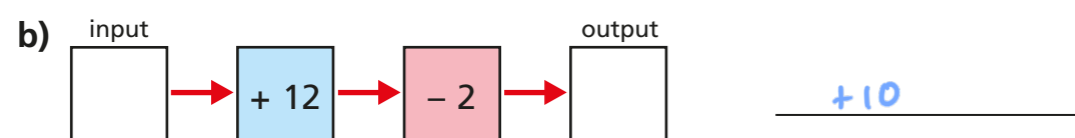
4 Tick the pairs of function machines that will give the same outputs for a given input.



Explain your reasoning to a partner.

5 Here are some 2-step function machines. For each machine, write a single step that would give the same output.

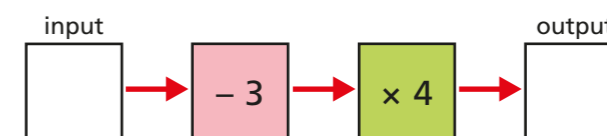
Check your answers by inputting values.



Can all 2-step function machines be written as a 1-step function machine?

Talk about it with a partner.

6 Here is a function machine.



a) Complete the table.

Input	10	3	13	73
Output	28	0	40	280

b) Rosie puts a number into the machine and she gets out the same number.

Work out Rosie's number.

4

7 Mr Hall and Mrs Rose order some photos online.

a) Mr Hall orders 16 photos.

How much does he pay?



£4.45

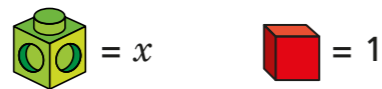
b) Mrs Rose pays £6.05

How many photos did she order?

24

Forming expressions

- 1 Tommy uses multilink cubes to represent an unknown number and base ten ones to represent 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) $x + 2$

c) $3x + 1$

b) $2x$

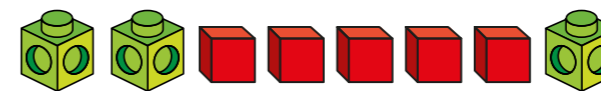
d) $x + 6$

Compare answers with a partner.

- 3 Use cubes to help you simplify the following expressions.

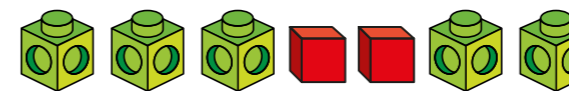
The first one has been done for you.

a) $2y + 5 + y$



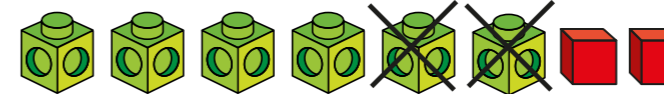
3y + 5

b) $3a + 2 + a + a$



5a + 2

c) $6p + 2 - 2p$

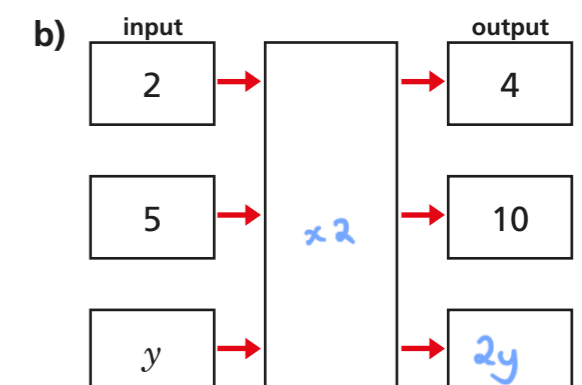
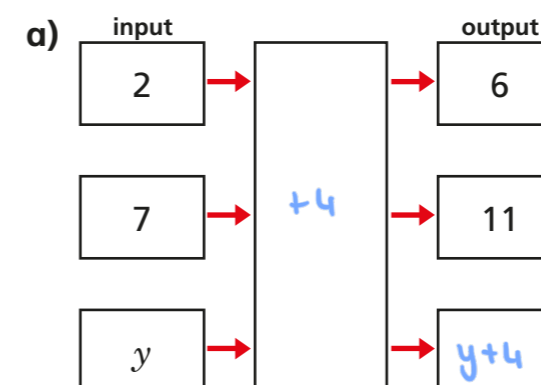


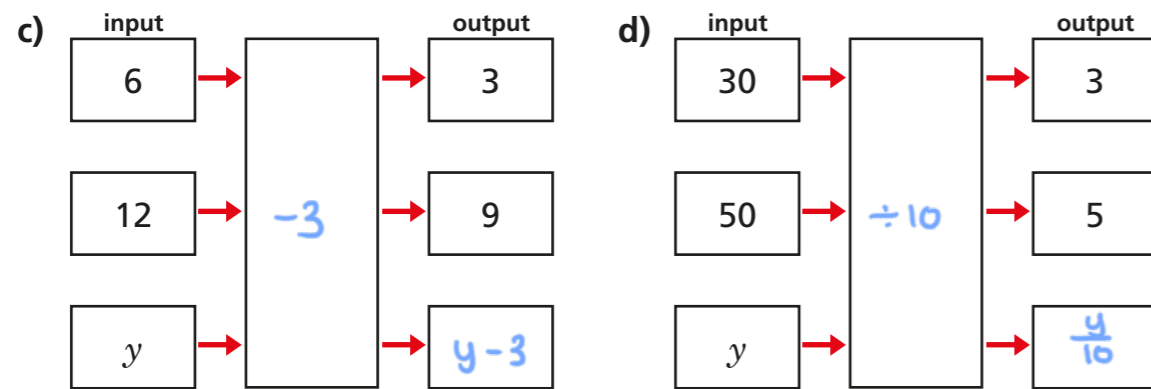
4p + 2

d) $m + 4 + 3m - 3$

4m + 1

- 4 Complete the function machines.

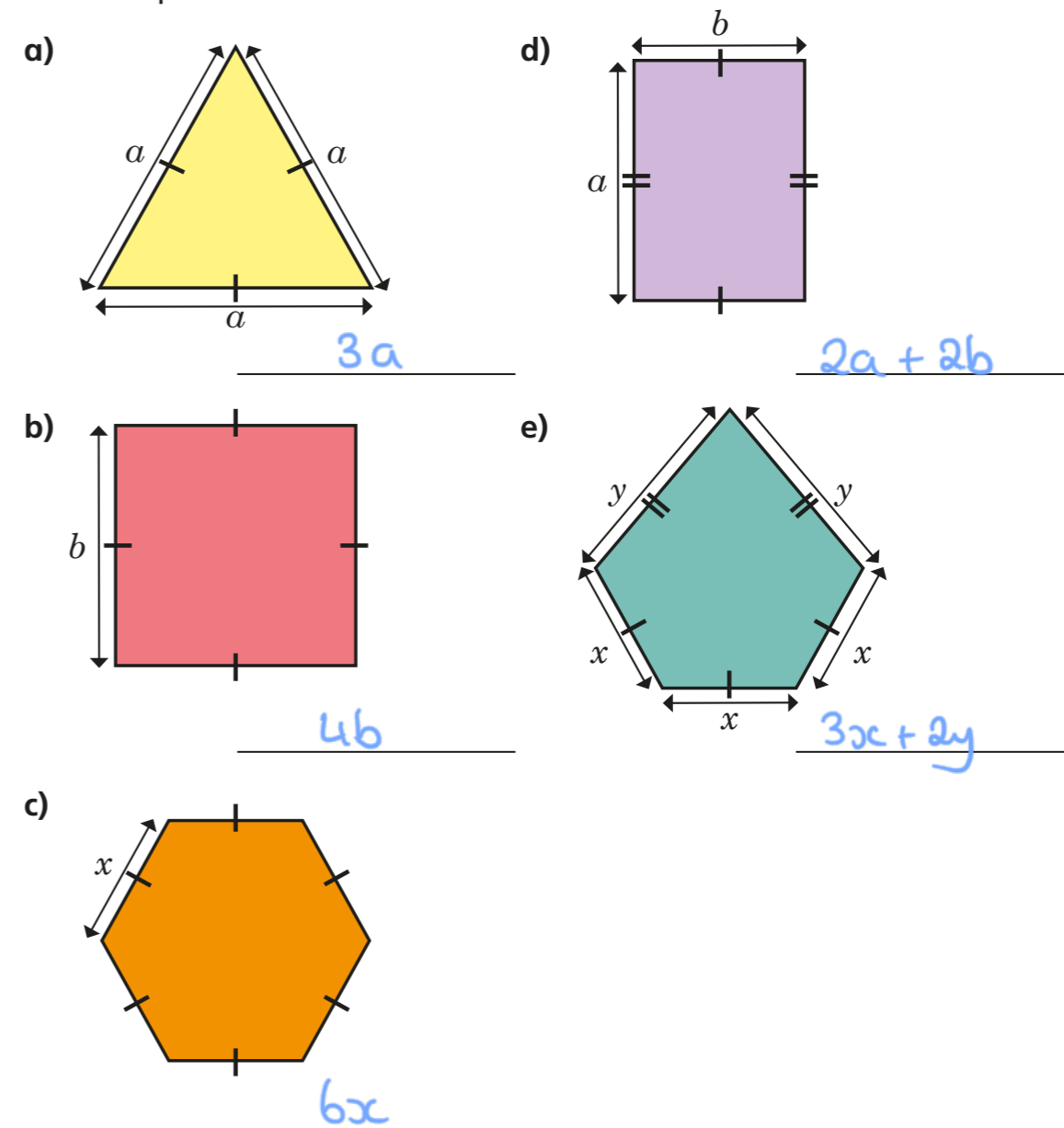




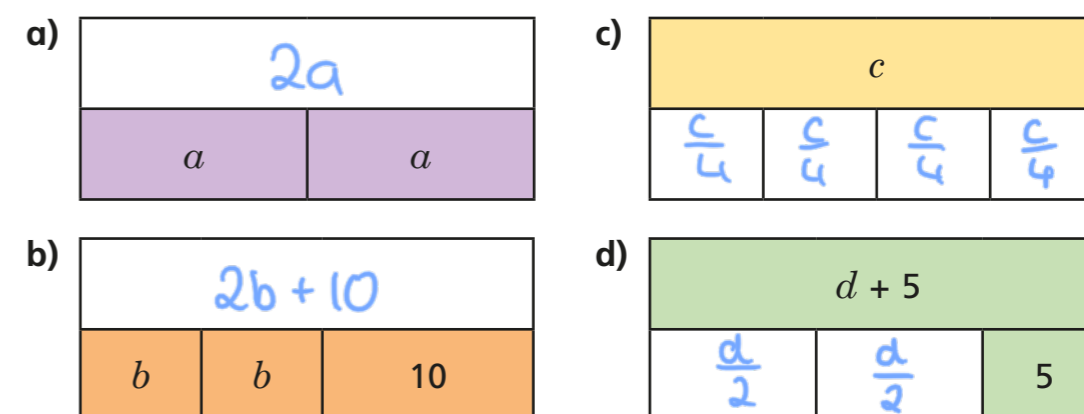
5 Match each statement to the equivalent algebraic expression. Write the missing statements.

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.





7 Complete the bar models.



Substitution

1

 = 4  = 5






Use the given facts to work out the calculations.

a)  +  + 

13



b)  +  - 

3

c)  +  +  +  + 

23

2

 = 12  = 5

Use the given facts to work out the calculations.

a)  - 

7

b)  × 

60

c) Create your own calculation that will be equal to 22

e.g. $\triangle + \square + \square$

3

If $x = 5$, write the values of the expressions in the corresponding grid.

The first one has been done for you.

$3x$	x^2	$2x - 5$
$4x + 2$	$\frac{x}{2}$	$2(x + 1)$
$7x$	$x + 9$	$x - 7$

15	25	5
22	2.5	12
35	14	-2

4

If $a = 10$ and $b = 6$, work out the values of the expressions.

a) $a + b = 16$

d) $2a + b = 26$

b) $a - b = 4$

e) $3a - 17 = 13$

c) $2a = 20$

f) $2(a - b) = 8$

5

If $m = \frac{4}{5}$ and $k = 0.1$, work out the value of $m + 2k$

1

6



Mo

It does not matter what p and q are, $p + q$ and $q + p$ will always give the same answer.

Do you agree with Mo? Yes

Explain your answer.

Addition is commutative.

7

$$m = 7 \quad n = 5$$

Write $>$, $<$ or $=$ to compare the expressions.

a) $2m$ $>$ 10

b) $n - 1$ $<$ 5

c) $2n + m$ $<$ $2m + n$

d) $7n$ $=$ $5m$

8

$$a = 10$$

Write the expressions in order, starting with the smallest value.

$$5a$$

$$a + 5$$

$$\frac{a}{5}$$

$$a^2$$

$$\frac{a}{5}$$

$$a + 5$$

$$5a$$

$$a^2$$

9

$$a = 15$$

Write three different algebraic expressions that give a value of 40

e.g.

$$2a + 10$$

$$3a - 5$$

$$\frac{8a}{3}$$

10 Complete the table.

x	$5x$	$5x - 1$
2	10	9
10	50	49
12	60	59
5	25	24
7	35	34
20	100	99



Solve simple one-step equations



1 Write an equation for each part-whole model.
Work out the value of the multilink cube in each equation.

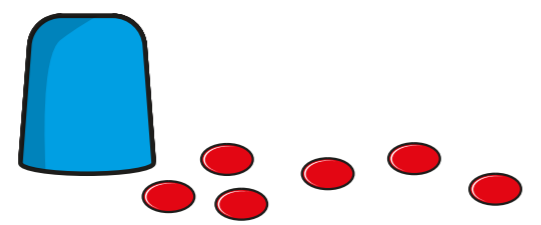
a)

=

b)

=

2 There are some counters under the cup.



There are 10 counters in total.

- a) If c is the number of counters under the cup, explain why $c + 6 = 10$
- b) Work out the value of c . $c =$
- c) How many counters are under the cup?



3 Write algebraic equations to represent the bar models.
Find the value of a in each one.

a)

$a =$

c)

$a =$

b)

$a =$

d)

$a =$

4 Nijah is solving the equation $x - 8 = 20$

$$x - 8 = 20$$

$$x = 20 - 8$$

$$x = 12$$

What mistake has Nijah made?

5 Solve the equations.

a) $x + 7 = 20$

$x = \boxed{13}$

b) $10y = 80$

$y = \boxed{8}$

c) $4m = 22$

$m = \boxed{5.5}$

d) $g - 3 = 15$

$g = \boxed{18}$

e) $32 = t - 5$

$t = \boxed{37}$

f) $\frac{u}{6} = 3$

$u = \boxed{18}$

6 Filip thinks of a number.

He subtracts 5 from his number.

He ends up with 10

Write an algebraic equation to represent Filip's problem.

$x - 5 = 10$

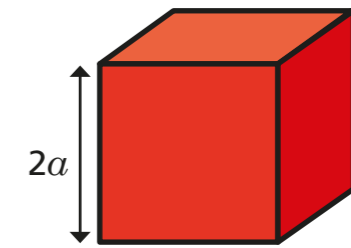
Solve the equation to work out his number.

$\boxed{15}$

7 Dexter builds a tower.

Each block is $2a$ high.

He uses 7 blocks.



The total height of his tower is 42 cm.

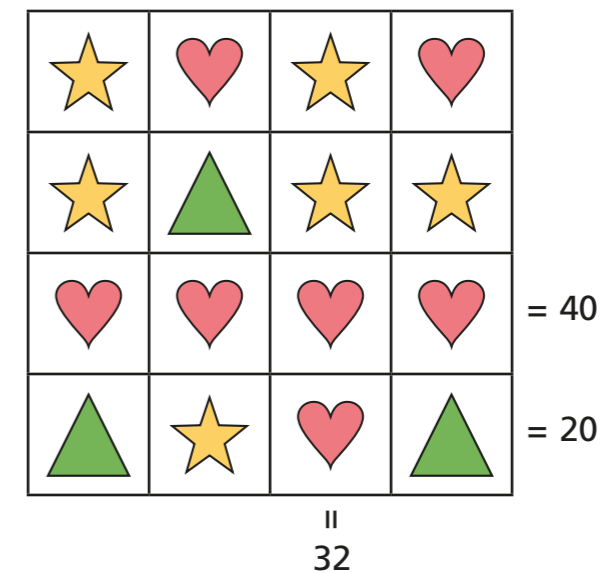
Write an equation to represent the height of Dexter's tower and find the value of a .

$14a = 42$

$a = \boxed{3}$ cm

8 Work out the value of each shape.

Write the equations that you solved to find the value of each shape.



♥ = $\boxed{10}$

★ = $\boxed{6}$

▲ = $\boxed{2}$

Work out the missing total of each row and column.

Compare answers with a partner.

