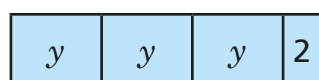# Substitute into 2-step expressions

1 Substitute $y = 6$ into each of these expressions.
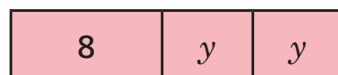
a) $3y + 2 =$ 20
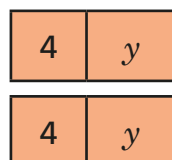
y	y	y	2

b) $3(y + 2) =$ 24

y	2
y	2
y	2

c) $8 + 2y =$ 20

8	y	y

d) $2(4 + y) =$ 20

4	y
4	y
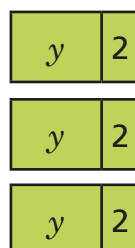
2 Jack is substituting $g = 3$ into these expressions.

$$4g + 5 \qquad 4(g + 5)$$

> I will get the same answer for both as I just need to multiply g by 4 and add on 5

Draw a function machine for each expression to show why Jack is incorrect.

$3 \rightarrow \times 4 \rightarrow + 5 \rightarrow 17$

$3 \rightarrow + 5 \rightarrow \times 4 \rightarrow 32$

$17 \neq 32$

3 Evaluate the expressions when $z = 6$

a) $3z + 7 =$ 25

$2z - 5 =$ 7

$10z + 6.3 =$ 66.3

b) $3(z + 7) =$ 39

$2(z - 5) =$ 2

$10(z + 5.3) =$ 113

c) $4 + z =$ 10

$4 + 3z =$ 22

$20 - 2z =$ 8

d) $\dfrac{z - 1}{5} =$ 1

$\dfrac{z}{3} + 2 =$ 4

$3 + \dfrac{z}{2} =$ 6

4 Dora has evaluated the expression $4x^2$ when $x = 3$

> 4 x 3 = 12
>
> $12^2 = 144$

Dora has made a mistake.

a) What calculation should Dora have completed first?
Correct her working out.

She should have squared the 3 first.

$3^2 = 9,$ $4 \times 9 = 36$

b) What would the expression need, for the answer 144 to be correct?

$(4x)^2$

c) Work out the value of these expressions when $x = 5$

$2x^2$	50
$(2x)^2$	100
$4x^2$	100
$(4x)^2$	400

5 Use a calculator to evaluate these expressions when $k = 16$ and $m = 0.5$

a) $k + m =$ 16·5

b) $k - m =$ 15·5

c) $m - k =$ -15·5

d) $\dfrac{k}{m} =$ 32

e) $\dfrac{m}{k} =$ $\frac{1}{32}$

f) $mk =$ 8

g) $3k - 7m =$ 44·5

h) $m(k - 8) =$ 4

i) $m(8 - k) =$ -4

j) $k^2 =$ 256

k) $3k^2 =$ 768

l) $(3k)^2 =$ 2,304

m) $k^m =$ 4

n) $4k^m =$ 16

6 Substitute different values of m in to each of these expressions.

$5m + 1$	$5(m + 1)$	$5m + 5$

a) Explain why for any value of m, the second and third expressions will always be equal.

$5(m+1) \quad = 5m+5$

b) Explain why for any value of m, the second expression will always be 4 more than the first.

$(5m+1) + 4 = 5m+5$