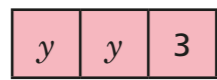


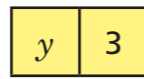
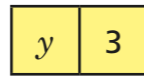
# Evaluate algebraic expressions with directed numbers

1 Use the bar models to help you substitute  $y = -5$  into the expressions.

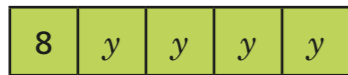
a)  $2y + 3$




$2(y + 3)$




b)  $8 + 4y$




$4(2 + y)$




What is the same and what is different in each part?

2 Evaluate the expressions when  $g = -8$

a)  $2g + 7 =$

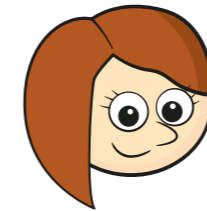
c)  $2 + 7g =$

b)  $2g - 7 =$

d)  $7g - (-2) =$

3 Rosie and Jack are substituting  $b = -2$  into this expression.

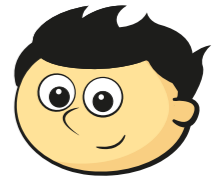
$5 - 4b$



Rosie

The answer is  $-3$

I think the answer is  $13$



Jack

Who is correct? \_\_\_\_\_

What mistake do you think the other person made?

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4 Evaluate the expressions when  $h = -7$

a)  $2h + 16 =$

c)  $16 - 2h =$

b)  $2h - 16 =$

d)  $-16 - 2h =$

5 Evaluate the expressions by substituting the values  $a = -6$ ,  $b = 5$ ,  $c = 2$  and  $d = -4$

a)  $a - d =$

b)  $ab =$

c)  $2d =$

$7(a - d) =$

$2(ab) =$

$d^2 =$

$-7(a - d) =$

$\frac{ab}{2} =$

$2d - d^2 =$

6

$x = -2$

$y = 10$

$z = 3$

Using only letters, write algebraic expressions that give these answers.

a) 12 \_\_\_\_\_

b) -20 \_\_\_\_\_

c) -15 \_\_\_\_\_

d) -60 \_\_\_\_\_

Compare answers with a partner. Did you get the same expressions?

7

Filip is evaluating the expression  $n - p^2$  when  $n = -7$  and  $p = -3$

$$\begin{aligned}
 & -7 - -3^2 \\
 & = -7 - -9 \\
 & = -7 + 9 \\
 & = 2
 \end{aligned}$$

What mistake has Filip made?

Correct his working out.

\_\_\_\_\_  
\_\_\_\_\_

How could Filip make sure he doesn't make this mistake again?

\_\_\_\_\_



8

Here are some expression cards.

$m - k$

$mk$

$\frac{k}{m}$

$\frac{m}{k}$

$2k - 8m$

$k^2$

What is the range of the cards when  $k = -8$  and  $m = -2$ ?

\_\_\_\_\_

9

An approximate rule for converting degrees Fahrenheit ( $F$ ) to degrees Celsius ( $C$ ) is given by the formula.

$$C = \frac{F - 30}{2}$$

a) Use this rule to convert 18 °F into °C.

\_\_\_\_\_

b) Aisha substitutes a different value for  $F$  and gets  $C = 0$   
What was Aisha's value for  $F$ ?

\_\_\_\_\_

10

If  $y$  is negative, which card would give the greater value?

$y + x$

$y - x$

Does it matter what the value of  $x$  is?

