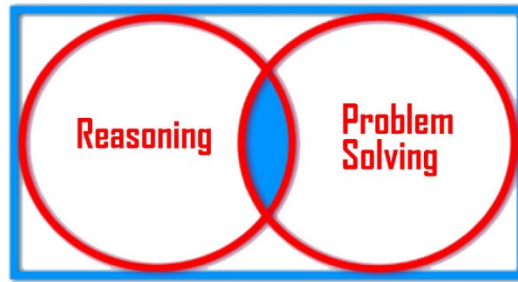


## GCSE Foundation (5 – 1)





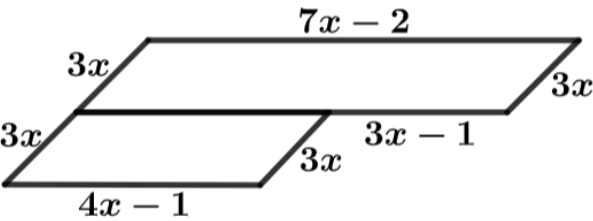
[fluidmaths.co.uk](http://fluidmaths.co.uk)

### Mathematical Reasoning Questions

#### (Expressions) – Set 1

#### Solutions

**The questions are repeated here for your convenience**

1	<p>Answer <b>True</b> or <b>False</b> <span style="float: right;"><u>Solution</u></span></p> <p>a) <math>6xy = 2x \times 3y</math>: <b>True</b>  b) <math>20ab = 40ab \div 2</math>: <b>True</b>  c) <math>20ab = 40 \div 2ab</math>: <b>False</b></p> <p style="text-align: right;"><b>[3marks]</b></p>
2	<p>If <math>a = 5</math> which of the following will be equivalent to <math>-6a</math></p> <p>a) <math>-65</math>  b) <math>-65a</math>  c) <math>-30</math>  d) <math>-30a</math></p> <p style="text-align: center;"><u>Solution</u></p> <p>Substitute 5 for <math>a</math> into the expression: <math>-6a = -6(5) = -30</math>  Answer: <b>C</b> <span style="float: right;"><b>[1mark]</b></span></p>
3	<p>Here are two parallelograms</p> <div style="text-align: center;">  </div> <p>The two shapes are put together to form the new shape shown below. Write down an expression for the perimeter of the new shape.</p> <div style="text-align: center;">  </div> <p style="text-align: center;"><u>Solution</u></p> <p>{Start working out the missing sides} <span style="float: right;"><b>[1mark]</b></span></p> $(7x - 2) - (4x - 1) = 3x - 1$ <div style="text-align: center;">  </div> <p>Perimeter of the shape = <math>4 \times 3x + (7x - 2) + (4x - 1) + (3x - 1)</math>  = <math>12x + 7x - 2 + 4x - 1 + 3x - 1</math></p> <p>{Simplify further by collecting the like terms}</p> <p>= <math>26x - 4</math> <span style="float: right;"><b>[2marks]</b></span></p>

4 Simplify the expression  $0.5x + 0.65y + 6x + 3y$ ?



Choose one answer

- a)  $6.5x + 0.95y$
- b)  $6.5x + 3.65y$
- c)  $10.55xy$
- d)  $6.5x + 0.68y$

**Solution**

$$\begin{aligned} 0.5x + 0.65y + 6x + 3y &= 0.5x + 6x + 3y + 0.65y \\ &= 6.5x + 3.65y \end{aligned}$$

Correct Answer: B

**[2marks]**

5 Simplify the expression  $x(2y + z) + 2(xy + 3z)$

Choose one answer

- a)  $2xy + xz + 2xy + 6z$
- b)  $4xy + xz + 6z$
- c)  $4yx + zx + 5z$
- d)  $4xy + xz + 5xz$

**Solutions**

$$\begin{aligned} x(2y + z) + 2(xy + 3z) & \quad \{\text{Expand brackets}\} \\ &= 2xy + xz + 2xy + 6z \\ &= 4xy + xz + 6z \quad \{\text{simplify}\} \end{aligned}$$

Correct Answer: B

**[2marks]**

- 6 John is  $x$  years old.  
 Laila is 15 years older than John  
 Lucy is 3 years younger than Laila  
 What is Lucy's age in terms of  $x$ ?  
 Choose one answer
- a)  $x + 18$
  - b)  $x + 12$
  - c)  $x - 18$
  - d)  $x - 12$

**Solution**

Laila's age =  $x + 15$

Lucy's age = Laila's age - 3 years

Therefore, Lucy's age =  $x + 15 - 3$  {Simplify}

Hence, Lucy's age will be  $x + 12$

[2marks]

- 7 Here are two sets of Expressions.  
 Match the Expressions in **Set A** to the equivalent Expression in **Set B**

Set A	Set B
$5ab + ab + 6ba$	$2b + 8a$
$2(4a + b)$	$-7b + 2a$
$ab - ab - ab$	$12ab$
$2(a - b) - 5b$	$-ab$

[4marks]

8 Given that  $2x = -14$ , which of the following will be equal to the value of the expression  $6x + 5$ ?

Choose one answer

a)  $-30$

b)  $-37$

c)  $-47$

d)  $47$

**Solution**

$$2x = -14$$

Therefore,  $x = -7$  {divide both sides by 2}

$$6x + 5 = 6(-7) + 5$$

$$= -42 + 5 = -37$$

Correct Answers: B

**[2marks]**

9 Choose the expression which is the same as 13 greater than  $2x$

Circle all the correct answers

a)  $13 < 2x$

b)  $13 + 2x$

c)  $2x + 13$

d)  $x + 7.5$

**Solution**

$$13 + 2x \text{ or } 2x + 13$$

Correct Answers: B and C

**[2marks]**

**10** The prices for different items at a supermarket are shown below



Item	Price
Smints	$\pounds(x + 1)$
Wine Gums	$\pounds(2x - 3)$
Crisps	$\pounds(x - 2)$
Cola	$\pounds 4x$

a) Write an expression for the total cost of all the items in the list

**Solution**

$$\begin{aligned} \text{The total cost} &= x + 1 + (2x - 3) + (x - 2) + 4x \\ &= 8x - 4 \end{aligned} \quad \text{[2marks]}$$

b) Tamara bought all the items but Smints.

She paid with a  $\pounds 5$  note.

Write down an expression for the change she received.

**Solution**

$$\begin{aligned} \text{Items bought} &= (2x + 3) + (x - 2) + 4x \\ &= 7x + 1 \\ &= 5 - (7x + 1) \\ &= 4 - 7x \end{aligned}$$

Hence, an expression for the change will be  $4 - 7x$   
**[2marks]**