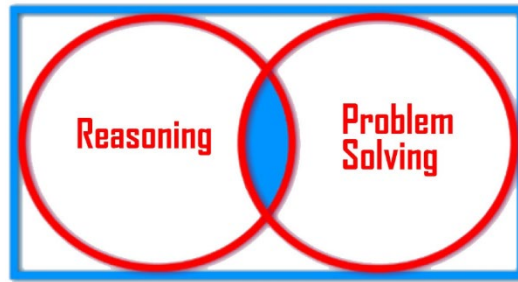


## GCSE Foundation (5 – 1)



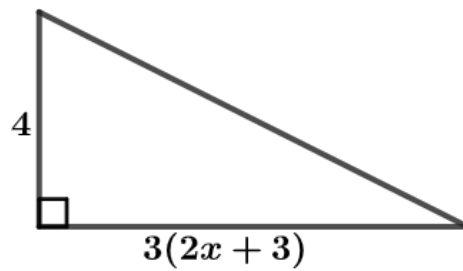
[fluidmaths.co.uk](http://fluidmaths.co.uk)

### Mathematical Reasoning Questions (Expanding and Factorising) – Set 1

**The marks shown are for guidance purposes only  
[Total marks: 27 Marks]**

1	<p>Choose the expression which is equivalent to <math>2(a + 3) + 5a</math></p> <p>a) <math>7a + 3</math>  b) <math>2a + 8a</math>  c) <math>11a</math>  d) <math>7a + 6</math></p> <p style="text-align: right;"><b>[2Marks]</b></p>												
2	<p>Choose the expression which is equal to <math>(a + b)(a - b)</math> from the options below.</p> <p>a) <math>a^2</math>  b) <math>-b^2</math>  c) <math>a^2 - b^2</math>  d) <math>a^2 + b^2</math></p> <p style="text-align: right;"><b>[1Mark]</b></p>												
3	<p>Match each expression in <b>Set A</b> to an equivalent expression in <b>Set B</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Set A</th> <th style="text-align: center;">Set B</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><math>18x^2 + 14x</math></td> <td style="text-align: center;"><math>-3(x - 5)</math></td> </tr> <tr> <td style="text-align: center;"><math>15 - 3x</math></td> <td style="text-align: center;"><math>4x(1 - 3x)</math></td> </tr> <tr> <td style="text-align: center;"><math>4x - 12x^2</math></td> <td style="text-align: center;"><math>2(9x^2 + 7x)</math></td> </tr> <tr> <td style="text-align: center;"><math>2(x + 3) + 6(x - 5)</math></td> <td style="text-align: center;"><math>x^2 + 4x + 3</math></td> </tr> <tr> <td style="text-align: center;"><math>(x + 1)(x + 3)</math></td> <td style="text-align: center;"><math>8x - 24</math></td> </tr> </tbody> </table> <p style="text-align: right;"><b>[5Marks]</b></p>	Set A	Set B	$18x^2 + 14x$	$-3(x - 5)$	$15 - 3x$	$4x(1 - 3x)$	$4x - 12x^2$	$2(9x^2 + 7x)$	$2(x + 3) + 6(x - 5)$	$x^2 + 4x + 3$	$(x + 1)(x + 3)$	$8x - 24$
Set A	Set B												
$18x^2 + 14x$	$-3(x - 5)$												
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$2(x + 3) + 6(x - 5)$	$x^2 + 4x + 3$												
$(x + 1)(x + 3)$	$8x - 24$												

4 Write out an expression for the area of the triangle below



[3Marks]

5 Kelsey is expanding the brackets below

$$2(2x + 3) - 5(x + 2)$$

**Here is her Answer**

Expand the brackets:  $6x + 6 + 5x + 10$

Collect all the like terms together:  $11x + 16$

Explain why Kelsey's answer is wrong and work out the correct answer.

[2Marks]

6	<p>Hamood is factorising the expression <math>16xy - 20y</math>  He writes: 4 is the highest common factor between 16 and 20  Therefore, when factorised, the expression will become  <math>4(4xy - 5y)</math>  Explain why Hamood is wrong and factorise the expression fully</p> <p style="text-align: right;"><b>[2Marks]</b></p>
7	<p>Complete the calculation below by filling in the missing numbers or expressions</p> $\square (2x + \square) + 5 = 12x^2 + 18x + \square$ <p style="text-align: right;"><b>[3Marks]</b></p>
8	<p>Answer <b>True</b> or <b>False</b></p> <p>a) <math>6a^2b + 5 = a(6ab + 5)</math></p> <p>b) <math>7 \times (2x + 3) = 14x + 21</math></p> <p>c) <math>(6x + 12y) \div 6 = x + 2y</math></p> <p style="text-align: right;"><b>[4Marks]</b></p>

9 Sharif is going to simplify the expression  $3x + 5x(2x + 7)$

**Here is his Answer**

$$3x + 5x = 8x$$

So

$$8x(2x + 7)$$

$$= 16x + 56x$$

$$= 72x$$

Identify the two mistakes Sharif made and simplify the expression

[3Marks]

10 Here is a pattern



$$\text{Line 1: } (x - y)(x + y) = x^2 - y^2$$

$$\text{Line 2: } (2x - 2y)(2x + 2y) = 4x^2 - 4y^2$$

$$\text{Line 3: } (3x - 3y)(3x + 3y) = 9x^2 - 9y^2$$

$$\text{Line 4: } (4x - 4y)(4x + 4y) = 16x^2 - 16y^2$$

Use the pattern to complete  $(ax - ay)(ax + ay)$

[2Marks]