

a)

$x = -4$ is a solution to the equation $2x^3 + 5x^2 - 14x - 8 = 0$.
Factorise $2x^3 + 5x^2 - 14x - 8$ fully.

Do you know a factor of $2x^3 + 5x^2 - 14x - 8$?	If $x = -4$ is a solution to the equation $2x^3 + 5x^2 - 14x - 8 = 0$, $(x + 4)$ is a factor of $2x^3 + 5x^2 - 14x - 8$.												
What is the other factor in the factor pair?	<table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>$2x^2$</td> <td>$-3x$</td> <td>-2</td> </tr> <tr> <td>x</td> <td>$2x^3$</td> <td>$-3x^2$</td> <td>$-2x$</td> </tr> <tr> <td>$+4$</td> <td>$+8x^2$</td> <td>$-12x$</td> <td>-8</td> </tr> </table> $2x^3 + 5x^2 - 14x - 8 = (x + 4)(2x^2 - 3x - 2)$		$2x^2$	$-3x$	-2	x	$2x^3$	$-3x^2$	$-2x$	$+4$	$+8x^2$	$-12x$	-8
	$2x^2$	$-3x$	-2										
x	$2x^3$	$-3x^2$	$-2x$										
$+4$	$+8x^2$	$-12x$	-8										
Can the other factor in the factor pair be factorised further?	<table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>$2x$</td> <td>-1</td> </tr> <tr> <td>x</td> <td>$2x^2$</td> <td>$-x$</td> </tr> <tr> <td>-2</td> <td>$-2x$</td> <td>-2</td> </tr> </table> $(2x^2 - 3x - 2) = (2x - 1)(x - 2)$		$2x$	-1	x	$2x^2$	$-x$	-2	$-2x$	-2			
	$2x$	-1											
x	$2x^2$	$-x$											
-2	$-2x$	-2											
What is the fully factorised form of $2x^3 + 5x^2 - 14x - 8$?	$2x^3 + 5x^2 - 14x - 8 = (2x - 1)(x - 2)(x + 4)$												

b)

$x = 1$ is a solution to the equation $x^3 + 3x^2 - x - 3 = 0$.
Factorise $x^3 + 3x^2 - x - 3$ fully.

Do you know a factor of $x^3 + 3x^2 - x - 3$?	If $x = 1$ is a solution to the equation $x^3 + 3x^2 - x - 3 = 0$, $(x - 1)$ is a factor of $x^3 + 3x^2 - x - 3$.												
What is the other factor in the factor pair?	<table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>x^2</td> <td>$+4x$</td> <td>$+3$</td> </tr> <tr> <td>x</td> <td>x^3</td> <td>$+4x^2$</td> <td>$+3x$</td> </tr> <tr> <td>-1</td> <td>$-x^2$</td> <td>$-4x$</td> <td>-3</td> </tr> </table> $x^3 + 3x^2 - x - 3 = (x - 1)(x^2 + 4x + 3)$		x^2	$+4x$	$+3$	x	x^3	$+4x^2$	$+3x$	-1	$-x^2$	$-4x$	-3
	x^2	$+4x$	$+3$										
x	x^3	$+4x^2$	$+3x$										
-1	$-x^2$	$-4x$	-3										
Can the other factor in the factor pair be factorised further?													
What is the fully factorised form of $x^3 + 3x^2 - x - 3$?													

c)
 $x = \frac{1}{2}$ is a solution to the equation $6x^3 + 13x^2 - 14x + 3 = 0$.
 Factorise $6x^3 + 13x^2 - 14x + 3$ fully.

Do you know a factor of $6x^3 + 13x^2 - 14x + 3$?	If $x = \frac{1}{2}$ is a solution to the equation $6x^3 + 13x^2 - 14x + 3 = 0$, $(2x - 1)$ is a factor of $6x^3 + 13x^2 - 14x + 3$.
What is the other factor in the factor pair?	
Can the other factor in the factor pair be factorised further?	
What is the fully factorised form of $2x^3 + 5x^2 - 14x - 8$?	

d)
 $x = 5$ is a solution to the equation $3x^3 - 8x^2 - 33x - 10 = 0$.
 Factorise $3x^3 - 8x^2 - 33x - 10$ fully.