Solving Quadratics – Quadratic Formula

Worksheet A

1 Complete the table below.

Q	Equation	a	b	c	Substitution	Simplification	Exact Answer	Answers to 3sf
Ex	$x^2 + 5x + 1 = 0$	1	5	1	$x = \frac{-5 \pm \sqrt{5^2 - 4(1)(1)}}{2(1)}$	$x = \frac{-5 \pm \sqrt{25-4}}{2}$	$x = \frac{-5 \pm \sqrt{21}}{2}$	**x = -4.79 & x = -0.209**
1	$x^2 + 6x + 1 = 0$							
2	$x^2 + 6x + 2 = 0$							
3	$x^2 + 7x + 2 = 0$							
4	$x^2 + 7x - 2 = 0$							
5	$x^2 - 7x - 2 = 0$							
6	$-x^2 - 7x - 2 = 0$							
7	$-x^2 - 7x + 2 = 0$							
8	$2 - 7x - x^2 = 0$							

9		1	7	3				
10		1	7	4				
11		1	-7	4				
12					$x=\frac{-(-7)\pm\sqrt{(-7)^2-4(-1)(4)}}{2(-1)}$			
13						$x=\frac{-(-8)\pm\sqrt{64+16}}{2(-1)}$		
14		-1					$x=\frac{-8\pm\sqrt{84}}{-2}$	
15	$\frac{1}{2}x^2+4x+5=0$	$\frac{1}{2}$						
16	$\frac{1}{2}(x^2+4x+5)=0$							
17	$\frac{1}{3}(x^2+4x+5)=0$							
18	$\frac{2x^2+4x+5}{3}=0$							

Solving Quadratics – Quadratic Formula

Worksheet B

2 Complete the table below.

Q	Equation	a	b	c	Substitution	Simplification	Exact Answer	Answers to 3sf
Ex	$2x^2 + 5x + 1 = 0$	2	5	1	$x = \frac{-5 \pm \sqrt{5^2 - 4(2)(1)}}{2(2)}$	$x = \frac{-5 \pm \sqrt{25-8}}{4}$	$x = \frac{-5 \pm \sqrt{17}}{4}$	**x = -2.28 & x = -0.219**
1	$2x^2 + 6x + 1 = 0$							
2	$2x^2 + 6x + 2 = 0$							
3	$2x^2 + 6x - 2 = 0$							
4	$2x^2 - 6x + 2 = 0$							
5	$2x^2 - 6x - 2 = 0$							
6	$3x^2 - 6x - 2 = 0$							
7	$4x^2 - 6x - 2 = 0$							
8	$4x^2 - 6x + 2 = 0$							

9	$2-6x+4x^2=0$							
10	$2-6x-4x^2=0$							
11	$1-3x-2x^2=0$							
12	$\frac{1}{2}-\frac{3}{2}x-x^2=0$							
13	$\frac{1}{6}-\frac{1}{2}x-\frac{1}{3}x^2=0$							
14	$\frac{1}{3}x^2+\frac{1}{2}x-\frac{1}{6}=0$							
15	$\frac{1}{3}x^2+\frac{1}{2}x-\frac{1}{6}=1$							
16	$\frac{1}{3}x^2+\frac{1}{2}x-\frac{1}{6}=x$							
17	$\frac{1}{3}x^2+\frac{1}{2}x-\frac{1}{6}=x^2$							
18	$\frac{1}{3}x^2+\frac{1}{2}x-\frac{1}{6}=-x^2$							

3 Amir is trying to solve the equation $2x^2 - 7x - 5 = 0$, his working is shown below.
Identify the mistakes that Amir has made and write the correct solution in the right-hand box.

Amir's Working	Amir's Mistakes – There are a few!!	Correct Working
$2x^2-7x-5=0$ $a=2,\ b=-7,\ c=5$ $x=\frac{-7\pm\sqrt{7^2-4(2)(5)}}{2}$ $x=\frac{-7\pm\sqrt{9}}{2}$ $x=\frac{-7\pm3}{2}$ $x=-5$ and $x=-2$		

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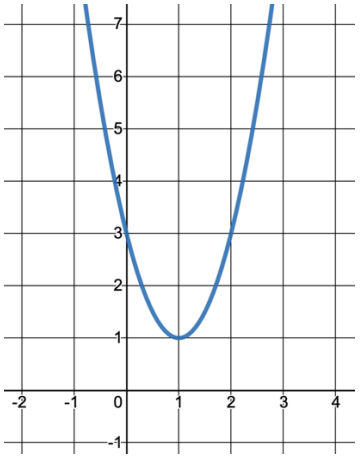

The diagram shows the curve $y = 2x^2 - 4x + c$.

a What is the value of *c*?

b What is the equation of the line of symmetry of the curve?

c Write down the values of a, b and c to use in the Quadratic Formula.

d Substitute your answers to part **c** into the Quadratic Formula.

e What do you notice?

f Why is this the case?

g What does your answers to parts **e** and **f** tell you about the number of *real* roots?

h How is your answer to part **g** shown on the graph?