# The Quadratic Formula

### Section A: Guided Questions

*a* = *b* = *c* =

The discriminant 

The two solutions are:



and



*a* = *b* = *c* =

The discriminant 

The two solutions are:

 to 2 d.p.

and

to 2 d.p.

*a* = *b* = *c* =

The discriminant 

The two solutions are:

 to 2 d.p.

and

to 2 d.p.

*a* = *b* = *c* =

The discriminant 

The two solutions are:

 to 2 d.p.

and

to 2 d.p.

### Section B

Solve these equations in your book checking your solutions in the answer box below:

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3 | -10.48 | -6.85 | 1.52 | 0.35 | 1 | -1.62 |
| -0.88 | -7 | 0.48 | -0.15 | -2.54 | -0.92 | 0.62 |
| 3 | 4.82 | -0.83 | -0.5 | 1.88 | -1 | 1.34 |

### Section C

The following equations will need rearranging to look like  before they can be solved by the same method.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| -1.83 | 6.53 | -0.36 | 1.25 | -4 | 3 | -2.15 |
| -4 | 2.76 | -1.55 | 2.33 | 3.41 | -1.61 | 0.59 |
| 5 | -1.08 | -1.53 | -1 | 2.28 | 3.55 | 4.65 |

### Section D

1 a Complete the square to solve .

b Use *the quadratic formula*, to solve the same equation, by taking *a* = 1, *b* = 8 and *c* = –7.

c Show, by simplifying your answer to part b, that both methods give the same solution.

2 By first rearranging the equation  into the form , where *a* is **positive**, solve this equation using the quadratic formula.

3 Rearrange  into a suitable form, and hence solve the equation using the quadratic formula.

4 Solve the equation 

5 a Find the **discriminant** of the equation .

b What makes this discriminant ‘nice’?

c Solve the equation using the formula

d Factorise , and hence solve the above equation by another method.

6 a Find the discriminant of the equation 

b Is this discriminant also ‘nice’?

c Solve the equation by both the formula and another method.

7 Use the idea established in questions 9 and 10 to determine which of these quadratic equations will factorise, and then factorise them.

  

  

 

8 a Complete the square to solve .

b Use the formula to solve the same equation.

c Show, by simplifying your answer to part b, that both methods give the same solution.

**Homework – The Quadratic Formula**

Solve the following equations using the method in your notes. You must write down what the values of *a, b,* and *c* are in each case.

Some of the questions need to be rearranged to look like before you can solve them.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. \*

Answer box for questions 1-5

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| -1.303 | 1.766 | -1.768 | 0.232 | -3.236 |
| 1.434 | -0.566 | 1.236 | -2.266 | 2.303 |

1 a Complete the square to solve .

b Use the last step of the formula you discovered today to solve the same equation.

c Show, by simplifying your answer to part b, that both methods give the same solution.

2 Solve  using the quadratic formula

3 Solve  using the quadratic formula

4 By first rearranging into the form , solve the equation  using the quadratic formula

5 By first rearranging, solve  using the quadratic formula

6 a Try to solve the equation  by first completing the square. What problem do you encounter?

b Try to solve the same equation by using the quadratic formula. What problem do you encounter?

c Show, by attempting to use the quadratic formula, that the equation  in insoluble.

7\* Rachel’s dog has chewed his way through part of her homework. She has been asked to solve a quadratic equation  but she can’t make out the number in front of *x*2 any more. Her teacher has little sympathy, but does tell her that the missing number is an integer greater than 2, and that the quadratic equation has two roots but doesn’t factorise. What is the missing number?

8\* a Complete the square to solve .

b Solve the same equation using the formula.

c Show, by simplifying your answer to part b, that both methods give the same solution.