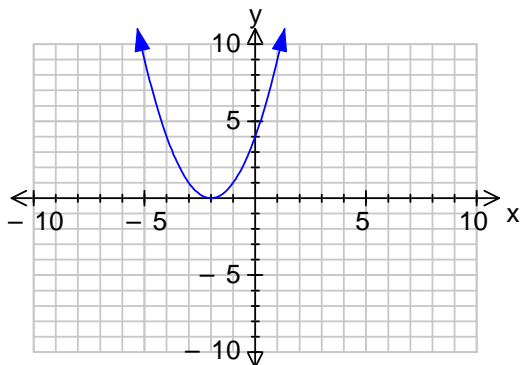


(C1-2.1a) Name:

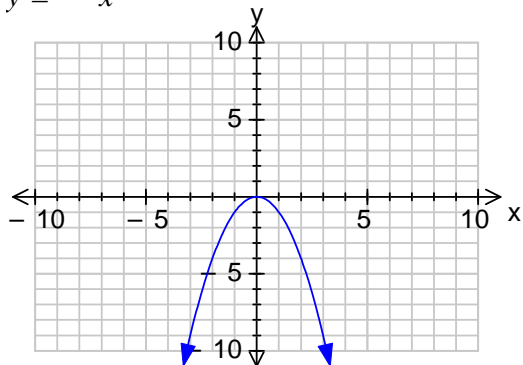
Homework Questions 1 – Plotting Quadratic Equations

1. Plot the following quadratic equations on graph paper (take the values of x from 4 to -4)

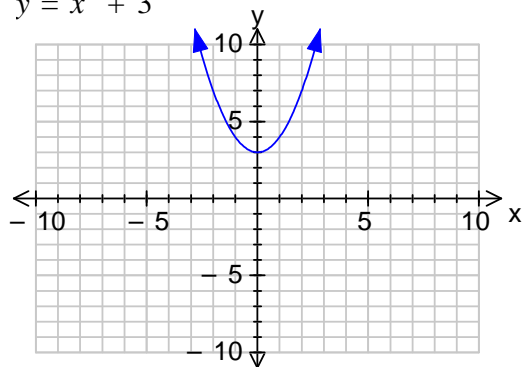
a) $y = (x + 2)^2$



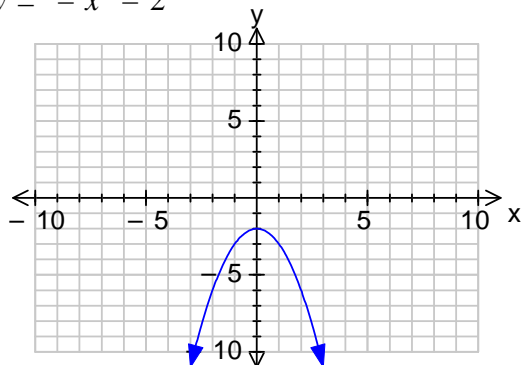
b) $y = -x^2$



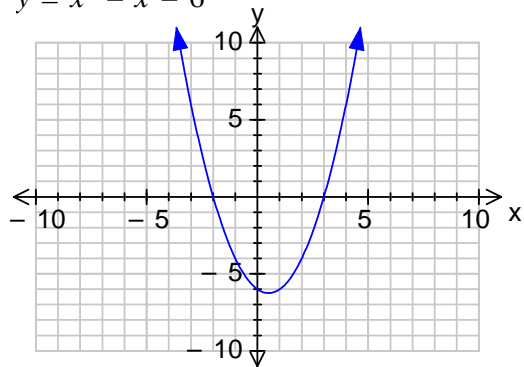
c) $y = x^2 + 3$



d) $y = -x^2 - 2$



e) $y = x^2 - x - 6$



2. State the minimum value of y for each of the graphs drawn above and the value of x at this point.

a) $y = (x + 2)^2$

Min $y = 0$ $x = -2$

b) $y = -x^2$

Min $y = \text{infinite}$ $x = 0$

c) $y = x^2 + 3$

Min $y = 3$ $x = 0$

d) $y = -x^2 - 2$

Min $y = \text{infinite}$ $x = 0$

e) $y = x^2 - x - 6$

Min $y = -6.25$ $x = 0.5$

3. State the line of symmetry for each of the graphs drawn above

a) $y = (x + 2)^2$

$X = -2$

b) $y = -x^2$

$X = 0$

c) $y = x^2 + 3$

$X = 0$

d) $y = -x^2 - 2$

$X = 0$

e) $y = x^2 - x - 6$

$X = 0.5$

(C1-2.2a) Name:

Homework Questions 2 – Solving Quadratic Equations

Solve the following quadratic equations

1. $(x + 2)(x + 4) = 0$

$$x = -2, -4$$

2. $(x - 5)(x - 6) = 0$

$$x = 5, 6$$

3. $(x - 7)(x - 4) = 0$

$$x = 4, 7$$

4. $x(x + 7) = 0$

$$x = 0, -7$$

5. $(2x + 3)(x - 8) = 0$

$$x = -1.5, 8$$

6. $(5x - 3)(x + 5) = 0$

$$x = 0.6, -5$$

Solve the following quadratic equations by factorizing first

7. $x^2 - 7x + 12 = 0$

$$x = 3, 4$$

8. $x^2 + 5x - 6 = 0$

$$x = 1, -6$$

9. $x^2 - 2x - 15 = 0$

$$x = 5, -3$$

10. $x^2 + 5x - 24 = 0$

$$x = 3, -8$$

11. $x^2 + 11x + 30 = 0$

$$x = -5, -6$$

12. $x^2 = 88 - 3x$

$$x = 8, -11$$

13. $x^2 = 6x - 8$

$$x = 2, 4$$

14. $7x = x^2 - 30$

$$x = -3, 10$$

15. $2x^2 - 3 = x$

$$x = 1.5, -1$$

16. $4x^2 - 29x + 7 = 0$

$$x = 0.25, 7$$

17. $4x^2 = x$

$$x = 0, 0.25$$

Solve these equations, leave your answer in surd form if necessary

18. $(3x - 2)^2 = 36$

$$x = 2.67, -1.33$$

19. $3x^2 = 27$

$$x = -3, 3$$

20. $(x - 4)^2 = 8$

$$x = \pm 2\sqrt{2} + 4$$

(C1-2.3a) Name:

Homework Questions 3– Completing the Square

Complete the square for these expressions

1. $x^2 - 6x + 8$

2. $x^2 - 4x + 9$

$$(x - 3)^2 - 1$$

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

3. $x^2 - 10x - 5$

4. $x^2 + 12x + 6$

$$(x - 5)^2 - 30$$

$$(x + 6)^2 - 30$$

5. $x^2 - 8x + 7$

6. $x^2 - 10x - 2$

$$(x - 4)^2 - 9$$

$$(x - 5)^2 - 27$$

7. $x^2 + 18x - 3$

8. $x^2 + 4x + 6$

$$(x + 9)^2 - 84$$

$$(x + 2)^2 + 2$$

9. $x^2 + 10x + 2$

10. $x^2 + 18x - 1$

$$(x + 5)^2 - 23$$

$$(x + 9)^2 - 82$$

(C1-2.4a) Name:

Homework Questions 4 – Solving Equations by Completing the Square

Solve the following quadratic equations by completing the square

1. $x^2 + 4x - 7 = 0$

$$\pm\sqrt{11} - 2$$

2. $x^2 + 12x + 9 = 0$

$$\pm 3\sqrt{3} - 6$$

3. $x^2 - 6x + 3 = 0$

$$\pm\sqrt{6} + 3$$

4. $x^2 - 8x - 2 = 0$

$$\pm 3\sqrt{2} + 4$$

5. $x^2 - x - 3 = 0$

$$\pm\sqrt{\frac{13}{4}} + \frac{1}{2}$$

6. $x^2 - 15x + 8 = 0$

$$\pm\sqrt{48\frac{1}{4}} + 7.5$$

7. $x^2 - 17x - 18 = 0$

$$\pm\sqrt{\frac{361}{4}} + 8.5$$

8. $2x^2 + 4x - 3 = 0$

$$\pm\sqrt{\frac{5}{2}} - 1$$

9. $5x^2 - 8x + 2 = 0$

$$\pm\frac{\sqrt{6}}{5} + \frac{4}{5}$$

10. $10x^2 + 3x - 2 = 0$

$$\pm\frac{\sqrt{89}}{20} - \frac{3}{20}$$

(C1-2.5a) Name:

Homework Questions 5 – Quadratic Formula

Solve the following quadratic equations using the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ leave your answer in surd form.

1. $x^2 + 5x - 17 = 0$

2. $7x^2 - x - 4 = 0$

$$\frac{-5 \pm \sqrt{93}}{2}$$

$$\frac{1 \pm \sqrt{113}}{14}$$

3. $2x^2 + 4x - 4 = 0$

4. $5x^2 = x + 2$

$$-1 \pm \sqrt{3}$$

$$\frac{1 \pm \sqrt{41}}{10}$$

5. $3x^2 + 4x = 6$

$$\frac{-2 \pm \sqrt{22}}{3}$$

(C1-2.6a) Name:

Homework Questions 6 – Sketching Graphs and using the Discriminant

Calculate the value of the Discriminant and hence state the number of real roots

1. $x^2 + 7x + 3 = 0$

2. $x^2 + x + 7 = 0$

3. $3x^2 - 2x - 1 = 0$

37

2 real

4. $x^2 - 20x + 100 = 0$

-27

No solution

5. $4x^2 + 5x - 2 = 0$

16

2 real

6. $x^2 = -11x - 3$

0

1 repeated

7. For what values of P will the roots of $px^2 - 2x + 5 = 0$ be real?

$$b^2 - 4ac \geq 0 \quad p \leq 0.2$$

8. Find the range of values for q for which the equation $2x^2 - 8x - q = 0$ has 2 real roots?

$$b^2 - 4ac > 0 \quad q > -8$$

9. For what values of y will the roots of $yx^2 - 2x - 5 = 0$ be equal?

$$b^2 - 4ac = 0 \quad y = -0.2$$

10. Sketch the graph of $y = x^2 - 2x - 8$ after first finding all the points of intersection and the value of the Discriminant

$$b^2 - 4ac = 36 \quad 2 \text{ real roots} \quad (4,0) (-2,0) (0,-8) \text{ u shape}$$

