Quadratics Practice Questions

Solving Quadratics

1. Find the roots of $2x^2 - 4x - 6$ using
   (a) factorising [2]
   (b) completing the square [3]
   (c) quadratic formula [3]
2. Sketch the graph of $y = 2x^2 - 4x - 6$ labelling all intersections with the axes and the vertex. [4]

Quadratic Inequalities

Find the set of values of x for which

1. $4x - 3 > 7 - x$, [2]
2. $2x^2 - 5x - 12 < 0$, [3]
3. **both** $4x - 3 > 7 - x$ **and** $2x^2 - 5x - 12 < 0$. [2]

Discriminants

The equation $x^2 + kx + (k + 3) = 0$, where k is a constant, has different real roots. Find the set of possible values of k. [4]

Simultaneous Equations

Solve the simultaneous equations

$$y = x - 4$$
$$2x^2 - xy = 8$$

[6]

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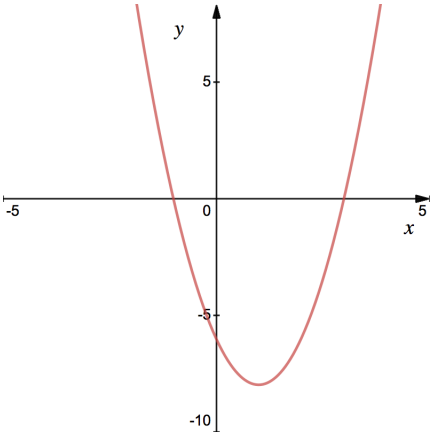
Solving Quadratics

All methods should give the solutions $x = -1$, $x = 3$. The graph of $y = 2x^2 - 4x - 6$ is as follows:



Quadratic Inequalities

1. $x > 2$
2. $-\frac{3}{2} < x < 4$
3. $2 < x < 4$

Discriminants

$k < -2$ or $k > 6$

Simultaneous Equations

$x = -2 \pm 2\sqrt{3}$, $y = -6 \pm 2\sqrt{3}$