

Equations and Inequalities

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1) Use elimination to solve the following simultaneous equations [2]

a)

$$\begin{aligned}x + 6y &= 35 \\ 5x - 5y &= -70\end{aligned}$$

b)

$$\begin{aligned}7x - 4y &= -94 \\ 5x + 6y &= -14\end{aligned}$$

2) Use substitution to solve the following simultaneous equations [2]

a)

$$\begin{aligned}4x + 5y &= 17 \\ x &= y + 2\end{aligned}$$

b)

$$\begin{aligned}y &= 4x - 2 \\ 7x + 6y &= 19\end{aligned}$$

3) Solve the following simultaneous equations

[4]

a)

$$x = 3y$$

$$y = x^2$$

b)

$$y = x^2 - 2$$

$$y = x + 10$$

c)

$$y = 2x + 5$$

$$y = x^2 - 3x + 11$$

d)

$$y = x + 7$$

$$x^2 + y^2 = 37$$

4) Solve the following inequality

[4]

a) $7z - 1 < 6$

b) $-5z + 2 > -3$

c) $10z + 37 \leq 3z + 79$

d) $2(z - 27) < 5(z - 6)$

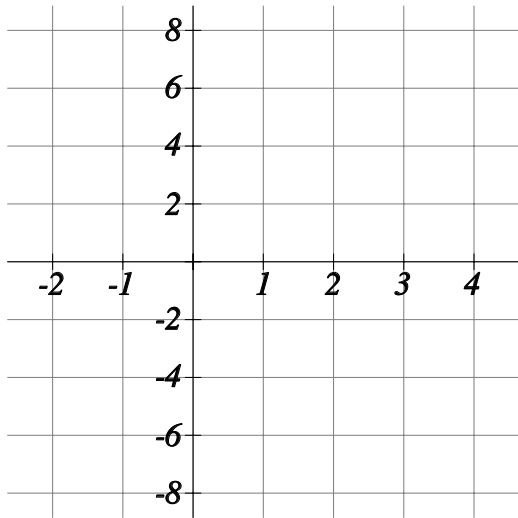
5) Find the values of A and B by rearranging the following inequality into the form $A < x < B$. [1]

$$-4 < 6x - 4 < 2$$

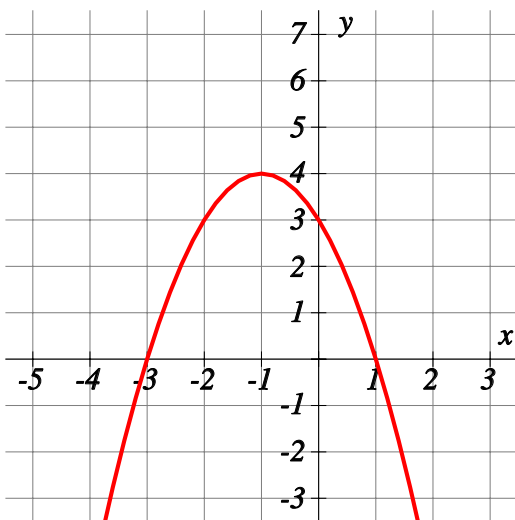
6) Find the set of values of x for which [1]

$$5y + 2 \geq 6y + 5 \text{ and } 5y + 8 \leq 7y + 24$$

7) Find the set of values of x for which $x^2 - x - 6 \leq 0$ by sketching the graph $y = x^2 - x - 6$.



8) Using the graph given below find the set of values that satisfy $-x^2 - 2x + 3 < 0$. [1]



9) Factorise and solve the following quadratic inequality [2]

a) $x^2 + 10x + 24 < 0$

b) $2y^2 - 15y + 25 > 0$

10) Find the range of values of k for which the following equation has real roots. [1]

$$kx^2 - 12x + 2 = 0$$

11) Find the range of values of k for which the following equation has no real roots. [1]

$$2x^2 + 8x + k = 0$$

Solutions for the assessment Equations and Inequalities

1) a) $x = -7$ and $y = 7$

b) $x = -10$ and $y = 6$

2) a) $x = 3$ and $y = 1$

b) $x = 1$ and $y = 2$

3) a) $x = 0$ and $y = 0$ or $x = \frac{1}{3}$ and $y = \frac{1}{9}$

b) $x = 4$ and $y = 14$ or $x = -3$ and $y = 7$

c) $x = 3$ and $y = 11$ or $x = 2$ and $y = 9$

d) $x = -6$ and $y = 1$ or $x = -1$ and $y = 6$

4) a) $z < 1$

b) $z < 1$

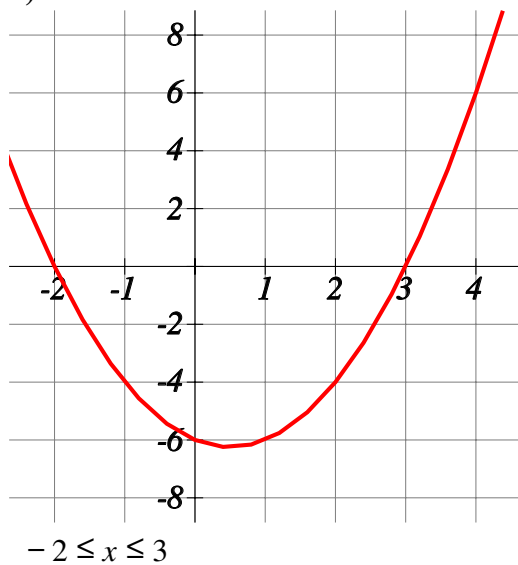
c) $z \leq 6$

d) $z > -8$

5) $A = 0$ and $B = 1$

6) As $y \leq -3$ or $y \geq -8$. Then final answer is $-8 \leq y \leq -3$

7)



8) $x < -3, x > 1$

9) a) $-6 < x < -4$

b) $y < 2\frac{1}{2}, y > 5$

10) $k < 18$

11) $k > 8$