

# SET 2: Applied Mathematics

## Tutorial 5

1. Solve the following quadratic equations by factorisation:

(a)  $x^2 + 6x - 27 = 0$  [Ans.  $x = 3$  or  $x = -9$ ]

(b)  $5x^2 + 22x - 15 = 0$  [Ans.  $x = \frac{3}{5}$  or  $x = -5$ ]

(c)  $15x^2 - 22x + 8 = 0$  [Ans.  $x = \frac{4}{5}$  or  $x = \frac{2}{3}$ ]

2. Solve the following quadratic equations by using the quadratic formula:

(a)  $x^2 - 7x + 12 = 0$  [Ans.  $x = 4$  or  $x = 3$ ]

(b)  $x^2 + 2x - 63 = 0$  [Ans.  $x = 7$  or  $x = -9$ ]

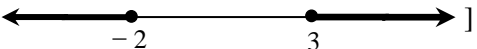
(c)  $2x^2 - 19x + 42 = 0$  [Ans.  $x = 6$  or  $x = 3.5$ ]

(d)  $40x^2 + 69x - 175 = 0$  [Ans.  $x = 1.4$  or  $x = -3.125$ ]

(e)  $2.35x^2 - 7.21x + 3.85 = 0$  [Ans.  $x = 2.38$  or  $x = 0.69$ ]

(f)  $0.793x^2 - 1.052x + 0.038 = 0$  [Ans.  $x = 1.289$  or  $x = 0.037$ ]

3. Solve each of the following inequalities. Express the solutions in both interval form and number line representation:

(a)  $2x^2 - 2x - 12 \geq 0$  [Ans.  $(-\infty, -2] \cup [3, \infty)$  or 

(b)  $3x^2 - 11x - 4 < 0$

(c)  $-x^2 + x + 20 \leq 0$

(d)  $-5x^2 - 18x + 8 \leq 0$