# Mathematics Test

M.M. - 40                                                     Duration:- 1hr. 15 mins.

1. State true/false and justify it with reasoning.                              $[1 \times 5]$

  (a) A quadratic equation can *not* have term containing $x^3$.
  (b) A quadratic equation can have 3 solutions.
  (c) A quadratic equation may *not* have any solution.
  (d) Two linear equations of two variables may have *infinitely* many solutions.
  (e) Two linear equations of two variables may *not* have any solution at all.

2. Solve the followings using both *discriminant* method & *middle-term* split.    $[3 \times 3]$

  (a) $2x^2 - 11x + 5 = 0$
  (b) $x^2 - 8 = 0$
  (c) $2x^2 + 2\sqrt{2}x - 3 = 0$

3. Solve the followings linear inequalities by showing it in graph        $[4.5 \times 2]$
    (graph need not be scaled, rough graph is enough)

  (a) $2x + 3y \leq 7, \quad x \geqslant 0, \quad y \leq 0, \quad x + y \leq 2$
  (b) $-x + y \geqslant 2, \quad x \geqslant 1, \quad y \geqslant -3, \quad 2x + y \leqslant 4$

4. Solve the followings:-                                                       $[3 \times 3]$

  (a) $\dfrac{9^4 \cdot 3^7}{3^{-3} \cdot 2^4}$       (b) $\dfrac{3 \times 10^{-21}}{6 \times 10^4} \times 4 \times 10^{18}$       (c) $\dfrac{\left(3^4 \cdot 9^6\right)^{1/4} \times 10^{-6}}{9^4 \cdot 2^{-4} \times 10^{-4}}$

5. Solve the followings for $x$ & $y$.                                          $[2 \times 4]$

  (a)   $3x + 2y = 2, \quad 9x - 4y = 3$
  (b)   $x - y = 2, \quad 2x + y = 3$
  (c)   $2x + y = 7, \quad 4x + 2y = 14$
  (d)   $x - y = 4, \quad 2x - 2y = 7$

———————— Best of Luck! ————————