Tutorial 4

1. Solve the following equations:

   a) $1.33x - 0.1x^2 = 1$

   b) $\dfrac{2x-4}{8-x} + \dfrac{1-x}{x-4} = 8$

2. Some equations in non-standard form can be solved by transformation:

   For example, for $x + \sqrt{x} - 12 = 0$,

   write it as $x - 12 = -\sqrt{x}$. Square both sides and then solve the resulting quadratic equation for x. (Remember checking your solution.)

3. For three consecutive integers, the middle one is m. The product of the largest and the smallest is to $m + 11$. Find these numbers.

4. The frame of a picture is a rectangle with dimension 3m by 4m. The width of the border is uniform. The area of the picture is half of the area of the frame. Find the width of the border.
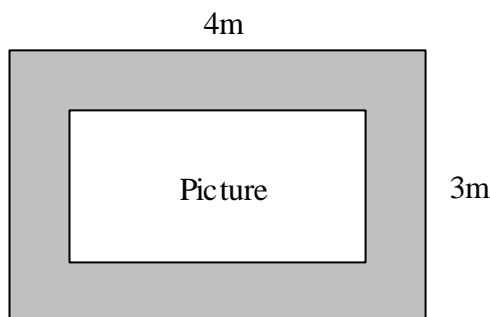
5. Find the value of the discriminant and state the number roots of the following equations.

   a) $x^2 - 3x - 4 = 0$

   b) $3x^2 - x + 3 = 0$

   c) $-4x^2 - 4x - 1 = 0$

   d) $9x^2 - 42x + 49 = 0$

   e) $8x^2 - 3x + 5 = 0$

Solution

1. a) 0.8, 1.25   b) $\dfrac{40}{11}$, 7

2. $x = 9$ ($x = 16$ is rejected)
3. –2, -3, -4 or 3, 4, 5
4. width = 0.5m (3m is rejected)
5. a) 25, 2 real roots,
    b) –35, no real roots
    c) 0, double root
    d) 0, double root
    e) –151, no real roots