Exercise 4.2

1) Find the roots of the following quadratic equations by factorisation:

(i) $x^2 - 3x - 10 = 0$

Sol^n: $\Rightarrow x^2 - 3x - 10 = 0$

$\Rightarrow x^2 - 5x + 2x - 10 = 0$

$\Rightarrow x(x-5) + 2(x-5) = 0$

$\Rightarrow (x-5)(x+2)$

If $x-5=0$, $x=5$ | If $x+2=0$, $x=-2$

(ii) $2x^2 + x - 6 = 0$

Sol^n: $2x^2 + x - 6 = 0$

$\Rightarrow 2x^2 + 4x - 3x - 6 = 0$

$\Rightarrow 2x(x+2) - 3(x+2) = 0$

$\Rightarrow (x+2)(2x-3) = 0$

$\Rightarrow$ If $x+2=0$, $x=-2$ | If $2x-3=0$, $x=\frac{3}{2}$

(iii) $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

Sol^n: $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

$\Rightarrow \sqrt{2}x^2 + 5x + 2x + 5\sqrt{2} = 0$

$\Rightarrow \sqrt{2}x^2 + 2x + 5x + 5\sqrt{2} = 0$

$\Rightarrow \sqrt{2}x(x+\sqrt{2}) + 5(x+\sqrt{2}) = 0$

$\Rightarrow (x+\sqrt{2})(\sqrt{2}x+5) = 0$

If $x+\sqrt{2}=0$, $x=-\sqrt{2}$ | If $\sqrt{2}x+5=0$, $x=\frac{-5}{\sqrt{2}}$

(iv) $2x^2 - x + \frac{1}{8} = 0$ (Multiply both sides with 8)

$\Rightarrow 16x^2 - 8x + 1 = 0$

$\Rightarrow 16x^2 - 4x - 4x + 1 = 0$

$\Rightarrow 4x(4x-1) - 1(4x-1) = 0$

$\Rightarrow (4x-1)(4x-1) = 0$

If $4x-1=0$, $x=\frac{1}{4}$ | If $4x-1=0$, $x=\frac{1}{4}$

(v) $100x^2 - 20x + 1 = 0$

$\Rightarrow 100x^2 - 10x - 10x + 1 = 0$

$\Rightarrow 10x(10x-1) - 1(10x-1) = 0$

$\Rightarrow (10x-1)(10x-1) = 0$

If $10x-1=0$	If $10x-1=0$
$x = \frac{1}{10}$	$x = \frac{1}{10}$