

1.  $x^4 - 5x^2 + 4 = 0$

$\hookrightarrow x^4 = (x^2)^2$

$x^2 = y \Rightarrow y^2 - 5y + 4 = 0 \quad \left. \begin{array}{l} y' = 1 \\ y'' = 4 \end{array} \right\}$

$x^2 = 1 \quad \underline{\underline{ou}} \quad x^2 = 4$

$x = \pm 1 \quad \quad \quad x = \pm \sqrt{4}$

$x = \pm 2$

$S = \{ \pm 1, \pm 2 \}$

2.  $4x^4 - 9x^2 + 2 = 0$

$x^2 = y$

$4y^2 - 9y + 2 = 0$

$\Delta = (-9)^2 - 4 \cdot 4 \cdot 2 \quad y = \frac{9 \pm \sqrt{49}}{2 \cdot 4}$

$\Delta = 81 - 32$

$\Delta = 49$

$y = \frac{9 \pm 7}{8} \quad \left. \begin{array}{l} y' = 2 \\ y'' = 1/4 \end{array} \right\}$

$x^2 = 2 \quad \underline{\underline{ou}} \quad x^2 = 1/4$

$x = \pm \sqrt{2} \quad \quad \quad x = \pm \sqrt{1/4}$

$x = \pm 1/2$

$S = \{ \pm 1/2, \pm \sqrt{2} \}$

3.  $3x^2(x^2 - 5) = 5 - x^2$

$x^2 = y$

$3y(y - 5) = 5 - y$

$3y^2 - 15y = 5 - y$

$3y^2 - 14y - 5 = 0$

$\Delta = (-14)^2 - 4 \cdot 3 \cdot (-5) \quad \left. \begin{array}{l} y = \frac{14 \pm \sqrt{256}}{2 \cdot 3} \\ y = \frac{14 \pm 16}{6} \end{array} \right\} \begin{array}{l} y' = 5 \\ y'' = -1/3 \end{array}$

$\Delta = 196 + 60$

$\Delta = 256$

$x^2 = 5 \quad \underline{\underline{ou}} \quad x^2 = -1/3$

$x = \pm \sqrt{5}$

$\hookrightarrow x \notin \mathbb{R}$

$S = \{ \pm \sqrt{5} \}$

4.  $x^4 + 5x^2 - 36 = 0$

$x^2 = y$

$y^2 + 5y - 36 = 0 \quad \left. \begin{array}{l} y' = 4 \\ y'' = -9 \end{array} \right\}$

$x^2 = 4 \quad \underline{\underline{ou}} \quad x^2 = -9$

$x = \pm \sqrt{4} \quad \quad \quad \hookrightarrow x \notin \mathbb{R}$

$x = \pm 2$

$S = \{ \pm 2 \}$

5.  $(x^2 + 1)^2 + 50 = 15(x^2 + 1)$

$x^2 = y$

$(y + 1)^2 + 50 = 15(y + 1)$

$y^2 + 2y + 1 + 50 = 15y + 15$

$y^2 - 13y + 36 = 0 \quad \left. \begin{array}{l} y' = 4 \\ y'' = 9 \end{array} \right\}$

$x^2 = 4 \quad \underline{\underline{ou}} \quad x^2 = 9$

$x = \pm \sqrt{4} \quad \quad \quad x = \pm \sqrt{9}$

$x = \pm 2 \quad \quad \quad x = \pm 3$

$S = \{ \pm 2, \pm 3 \}$