

ACHA3000 Exam:

① (i) $x^4 \times x^6 \times x = x^{11}$ (ii) $2x^2 \times 3x^3 \times 2x = 12x^6$
 (iii) $\frac{x^4 \times x^3 \times x^2}{x^9} = \frac{x^9}{x^9} = 1$ (iv) $(3x^2)^3 = 3x^2 \times 3x^2 \times 3x^2 = 27x^6$
 (v) $\sqrt{x} \times \sqrt{x} = (\sqrt{x})^2 = (x^{\frac{1}{2}})^2 = (x^1) = x$

② (i) $15x - 2 = 12x + 9$ (ii) $3(7x - 1) = 6(x + 3)$ (iii) $\frac{5x + 3}{4} = \frac{2x - 1}{9}$
 $15x - 12x = 9 + 2$ $21x - 3 = 6x + 18$
 $3x = 11$ $21x - 6x = 18 + 3$ $9(5x + 3) = 4(2x - 1)$
 $x = \frac{11}{3}$ $15x = 21$ $45x + 27 = 8x - 4$
 $x = \frac{21}{15}$ $45x - 8x = -27 - 4$
 $x = \frac{7}{5}$ $37x = -31$
 $x = \frac{-31}{37}$

③ (i) $x^2 + 10x + 21 = 0$ (ii) $x^2 - 3x + 2 = 0$
 $(x + 7)(x + 3) = 0$ $(x - 1)(x - 2) = 0$
 $\therefore x + 7 = 0, x + 3 = 0$ $\therefore x - 1 = 0, x - 2 = 0$
 $x = -7, x = -3$ $x = 1, x = 2$
 (iii) $x^2 + 12x + 20 = 0$ (iv) $x^2 - 64 = 0$ (v) $2x^2 + 9x + 10 = 0$
 $(x + 10)(x + 2) = 0$ $(x - 8)(x + 8) = 0$ $(2x + 5)(x + 2) = 0$
 $\therefore x + 10 = 0, x + 2 = 0$ $\therefore x = \pm 8$ $\therefore 2x + 5 = 0, x + 2 = 0$
 $x = -10, x = -2$ $2x = -5, x = -2$
 $x = \frac{-5}{2}$

④ $14x^2 + 3x = 11 \rightarrow 14x^2 + 3x - 11 = 0$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{-3 \pm \sqrt{(3)^2 - 4(14)(-11)}}{2(14)}$$

$$\frac{-3 \pm \sqrt{625}}{28}$$

$$\frac{-3 \pm 25}{28}$$

$$x = 0.79 \text{ to 2 d.p.}, x = -1.00 \text{ to 2 d.p.}$$

$$(9 + 616) = 625$$

$$\sqrt{625} = 25$$