⑤ $5x + 3y = 39$ $(\times 2)$ ①
$8x - 2y = 42$ $(\times 3)$ ②

$10x + 6y = 78$ ③
$24x - 6y = 126$ ④ ⊕

$34x = 204$
$x = \frac{204}{34}$

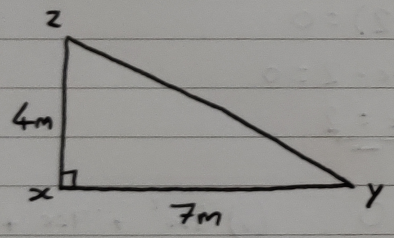
$x = 6$

Sub into ①

$5(6) + 3y = 39$
$30 + 3y = 39$
$3y = 39 - 30$
$y = \frac{9}{3}$
$y = 3$

⑥ $5(2x^2 - y^2) - x^2(x^2 - y) - x^2y - x^4$
$10x^2 - 5y^2 - x^4 + x^2y - x^2y - x^4$
$10x^2 - 5y^2 - 2x^4$

⑦



(i) $\hat{Y}$: $\text{Tan } Y = \frac{O}{A}$
$\text{Tan } Y = \frac{4}{7}$
$Y = \text{Tan}^{-1}\left(\frac{4}{7}\right)$
$\hat{Y} = 29.74°$

(ii) $\hat{Z}$: $\text{Tan } Z = \frac{O}{A}$
$\text{Tan } Z = \frac{7}{4}$
$Z = \text{Tan}^{-1}\left(\frac{7}{4}\right)$
$Z = 60.26°$

Check: $90 + 60.26 + 29.74$
$= 180°$

(iii) $YZ^2 = XZ^2 + XY^2$
$YZ^2 = 4^2 + 7^2$
$YZ^2 = 16 + 49$
$YZ = \sqrt{65}$
$YZ = 8.06\text{m}$

⑧ (i) $\sqrt[3]{x} = x^{\frac{1}{3}}$ (ii) $1 = x^0$

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) $15x - 2 = 12x + 9$

$15x - 12x = 9 + 2$

$3x = 11$

$x = \frac{11}{3}$

(ii) $3(7x - 1) = 6(x + 3)$

$21x - 3 = 6x + 18$

$21x - 6x = 18 + 3$

$15x = 21$

$x = \frac{21}{15}$

$x = \frac{7}{5}$

(iii) $\frac{5x + 3}{4} = \frac{2x - 1}{9}$

$9(5x + 3) = 4(2x - 1)$

$45x + 27 = 8x - 4$

$45x - 8x = -27 - 4$

$37x = -31$

$x = \frac{-31}{37}$

③ (i) $x^2 + 10x + 21 = 0$

$(x + 7)(x + 3) = 0$

$\therefore x + 7 = 0, \quad x + 3 = 0$

$x = -7 \qquad x = -3$

(ii) $x^2 - 3x + 2 = 0$

$(x - 1)(x - 2) = 0$

$\therefore x - 1 = 0, \quad x - 2 = 0$

$x = 1 \qquad x = 2$

(iii) $x^2 + 12x + 20 = 0$

$(x + 10)(x + 2) = 0$

$\therefore x + 10 = 0, \quad x + 2 = 0$

$x = -10 \qquad x = -2$

(iv) $x^2 - 64 = 0$

$(x - 8)(x + 8) = 0$

$\therefore x = \pm 8$

(v) $2x^2 + 9x + 10 = 0$

$(2x + 5)(x + 2) = 0$

$\therefore 2x + 5 = 0, \quad x + 2 = 0$

$2x = -5 \qquad x = -2$

$x = \frac{-5}{2}$

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

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

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

$(9 + 616) = 625$

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

$\sqrt{625} = 25$

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

$x = 0.79$ to 2 d.p, $x = -1.00$ to 2 d.p