

1.

$$i) x^6 \times x^8 \times x^2 \times x = x^{17}$$

$$6 + 8 + 2 + 1 = 17$$

$$ii) (2x^2)^4 \times 3x^3 \quad 16x^8 \times 3x^3 \quad 16 \times 3 = 48$$

$$x^8 \times x^3 = x^{11}$$

$$= 48x^{11}$$

$$iii) \frac{x^2 \times x^{10} \times x}{x^3} = \frac{x^{13}}{x^3} = x^{10}$$

$$iv) 2\sqrt{x} \times 3\sqrt{x} \quad 2x \times 3 = 6x$$

$$v) 1 = x \quad ?$$

2)

$$i) 7x - 1 = 5x + 4$$

$$\quad \quad \quad +1 \quad \quad \quad +1$$

$$7x = 5x + 5$$

$$\quad -5 \quad \quad -5$$

$$2x = 5 \quad x = 2.5$$

$$ii) 10(3x+2) = 7(-2x-1)$$

$$\cancel{30x} + 20 = \cancel{-14x} - 7 \quad 30x + 20 = -14x - 7$$

$$\cancel{30x} + \cancel{-14x} = -7 - 20 \quad 30x + 14x = -7 - 20$$

$$\cancel{20} - 7 = -13$$

$$44x = -27$$

$$x = -\frac{27}{44}$$

$$x = -0.613$$

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

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

$$\begin{array}{r} 6x+3 \\ -1 \end{array} = \begin{array}{r} 4x-1 \\ -1 \end{array}$$

$$6x+4 = 4x$$

$$\begin{array}{r} 6x+4 \\ -4 \end{array} = \begin{array}{r} 4x \\ -4 \end{array}$$

$$2x = -4$$

$$x = -2$$

$$\text{iv)} \quad (x+2)^2 = (x+3)(x+5)$$

$$\cancel{2x+4} = \cancel{x^2+3x+5x+15}$$

$$\cancel{2x+4} = \cancel{x^2+8x+15}$$

$$(x+2)(x+2) = (x+3)(x+5)$$

$$2x+2x+4 = \cancel{x^2+3x} + \cancel{x^2+5x+3x+5}$$

$$\begin{array}{r} 4x+4 \\ +4 \end{array} = \begin{array}{r} 8x+5 \\ +4 \end{array}$$

$$4x = 8x+9$$

$$9 \div 4 = \frac{9}{4} = 2.25$$

$$x = -2.25$$

3)

$$\text{i)} \quad x^2 + 9x + 14 = 0$$

$$x^2 + 7x + 2x + 14 = 0$$

$$x(x+7) + 2(x+7) = 0$$

$$(x+7)x(x+2) = 0$$

$$x = -7 \quad x = -2$$

$$x_1 = -7$$

$$x_2 = -2$$

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ii) $x^2 - 7x + 10 = 0$

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

$$\cancel{x(x-2)} \cancel{x-5} \quad x(x-2) - 5(x-2) = 0$$

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

$$x-2=0$$

$$x-5=0$$

$$x=2$$

$$x=5$$

$$x_1=2, x_2=5$$

iii) $x^2 + 9x - 20 = 0$

$$\cancel{x^2+10} \quad x^2 + 10x - 2x - 20 = 0$$

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

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

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

$$x+10=0$$

$$x-2=0$$

$$x_1 = -10$$

$$x_2 = 2$$

iv) $x^2 - 49 = 0$

$$x^2 = 49 \quad \sqrt{49} = 7$$

$$x = 7$$

$$x_1 = -7$$

$$x_2 = 7$$

v) $2x^2 - 3x - 20 = 0$

$$2x^2 + 5x - 8x - 20 = 0$$

$$x(2x+5) - 4(2x+5) = 0$$

$$(2x+5)(x-4) = 0$$

$$2x+5=0$$

$$x_1 = -2.5$$

$$x-4=0$$

$$x_2 = 4$$

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4) $17x^2 = -5x + 14$

(use quadratic)

$$17x^2 - 5x - 14 = 0$$

$$x = \frac{-5 \pm \sqrt{5^2 - 4 \times 17 \times (-14)}}{2 \times 17}$$

$$x = \frac{-5 \pm \sqrt{25 + 952}}{34}$$

$$x = \frac{-5 \pm \sqrt{977}}{34}$$

$$x = \frac{-5 \pm \sqrt{977}}{34}$$

5) $6x + 5y = 35$
 $7x - 4y = 31$

~~6x~~ $6 \times 5 + 5y = 35$
 $7 \times 5 - 4y = 31$
4

$$6 \times 5 + 5 \times 1 = 35$$

$$7 \times 5 - 4 \times 1 = 31$$

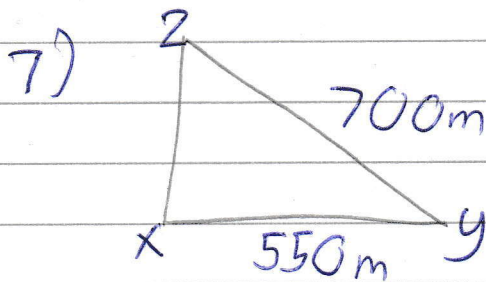
$$x = 5 \quad y = 1$$

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i) ~~$\cos x = \frac{550}{700}$~~

~~$700^2 = 550^2 + ?^2$~~

$700^2 = 490000$

$550^2 = 302500$

$490000 - 302500 = 187500$

$\sqrt{187500} = 433.01$

$zx = 433.01\text{m}$

ii) angle y

~~$\cos^{-1} \frac{550}{700}$~~ $\cos^{-1} \frac{550}{700} = 38.21$

$y = 38.21^\circ$