

$$① i) = \boxed{x^{17}}$$

$$ii) (2x^2)^4 \times 3x^3$$

$$16x^8 \times 3x^3$$

$$= \boxed{48x^{11}}$$

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

$$\downarrow$$

$$\frac{x^{13}}{x^3} = \boxed{x^{10}}$$

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

$$v) x^0$$

$$② i) 7x - 5x = 4 + 1$$

$$2x = 5$$

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

$$ii) ~~30x + 20 = -14x - 7~~$$

$$30x + 20 = -14x - 7$$

$$30x + 14x = -7 - 20$$

$$44x = -27$$

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

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

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

$$\cancel{3x-3} = \cancel{8x+4}$$

$$3x-3 = 8x+4$$

$$3x-8x = 4+3$$

$$-5x = 7$$

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

$$\text{iv) } x^2 + 4x + 4 = x^2 + 5x + 3x + 15 \quad (1) \quad (2)$$

$$4x + 4 = 5x + 3x + 15$$

$$4x + 4 = 8x + 15$$

$$4x - 8x = 15 - 4$$

$$-4x = 11$$

$$x = -\frac{11}{4}$$

$$(3) i) x^2 + 7x + 2x + 14 = 0$$

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

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

$$x+7=0$$

$$x+2=0$$

$$x = -7$$

$$x = -2$$

$$x_1 = -7, x_2 = -2$$

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

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

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

$$x-2=0$$

$$x-5=0$$

$$x = 2$$

$$x = 5$$

$$x_1 = 2, x_2 = 5$$

~~Roots are~~

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$$\text{iii) } x^2 + 10x - 2x - 20 = 0$$

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

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

$$x+10 = 0$$

$$x-2 = 0$$

$$\begin{aligned} x &= -10 \\ x &= 2 \end{aligned}$$

$$\downarrow$$

$$x_1 = -10 \quad x_2 = 2$$

$$\text{iv) } x^2 = 49$$

$$x = -7$$

$$x = 7$$

$$\downarrow$$

$$x_1 = -7 \quad x_2 = 7$$

$$\text{v) } 2x^2 + 5x - 8x - 20 = 0$$

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

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

$$2x+5 = 0$$

$$x-4 = 0$$

$$\begin{aligned} x &= -\frac{5}{2} \\ x &= 4 \end{aligned}$$

$$(4) 17x^2 + 5x - 14 = 0$$

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

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

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

$$x_1 = \frac{-5 + \sqrt{977}}{34}$$

$$x_2 = \frac{-5 - \sqrt{977}}{34}$$

$$x_1 = 1.06639$$

$$x_2 = 0.772265$$

$$(5) 6x + 5y = 35$$

$$x = \frac{31}{7} + \frac{4}{7}y$$

$$y = 1$$

$$x = \frac{31}{7} + \frac{4}{7} \times 1$$

$$x = 5$$

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

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

$$x = 5$$

$$(x, y) = (5, 1)$$

$$y = 1$$

⑦

$$700 - 550 = 150$$

$$550^2 + 150^2 = 2y^2$$

$$2y^2 = 320500$$

$$\sqrt{320500} = 570.1$$

$$2y = 570.1$$

$$\sin Z = 0.26$$

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$$Z = \sin^{-1}(0.26)$$

$$Z = 15.07$$

i) 180 m

ii) Angle

$$Y = 74.3^\circ$$