

Monday 1st November 2021, 11:55 AM
ACHA3000
2005053

①

i) $x^6 \times x^5 \times x^2 \times x = 6+5+2+1 = 14 \quad x^{14}$

ii) $(2x^2)^4 \times 3x^3$
 $16x^8 \times 3x^3 = 48x^{11}$

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

iv)

v) x

②

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

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

$$2x = 3$$

$$x = \frac{3}{2} = x = 0.5$$

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

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

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

$$44x = -27$$

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

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

$$\begin{aligned} 3(x-1) &= 4(2x+1) \\ 3x-1 &= 8x+4 \quad -4-1 = 8x-3x \\ -5 &= 5 \\ x &= -1 \end{aligned}$$

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②

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

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

$$x^2 + 2x + 2x + 4 = x^2 + 3x + 3x + 15$$

$$2x + 2x + 4 = 5x + 3x + 15$$

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

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

$$-11 = 12x$$

$$x = -\frac{11}{12}$$

③

$$\text{i) } x^2 + 4x + 14 = 0$$

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

$$x+7=0 \quad x+2=0$$

$$\underline{x = -7} \quad \underline{x = -2}$$

$$\text{ii) } x^2 - 7x + 10 = 0$$

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

$$x-5=0 \quad x-2=0$$

$$\underline{x = 5} \quad \underline{x = 2}$$

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

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

$$x+10=0 \quad x-2=0$$

$$\underline{x = -10} \quad \underline{x = 2}$$

$$\text{iv) } x^2 - 49 = 0$$

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

$$x-7=0 \quad x+7=0$$

$$\underline{x = 7} \quad \underline{x = -7}$$

$$\text{v) } 2x^2 - 3x - 20 = 0$$

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④ $17x^2 = -5x + 14$

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

$a=17 \quad b=5 \quad c=-14$

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

$x = \frac{-5 \pm \sqrt{25 - 952}}{2(17)}$

$x = \frac{-5 \pm \sqrt{-927}}{34}$

$x = \frac{-5 - 927}{34} \rightarrow x = \frac{-932}{34} \quad x = \frac{-466}{17}$

$x = \frac{-5 + 927}{34} \rightarrow x = \frac{922}{34} \quad x = \frac{461}{17}$

⑤ $6x + 5y = 35$ ① $x \times 4$

$7x - 4y = 31$ ② $x \times 5$

$24x + 20y = 140$ ③

$-35x + 20y = -155$ ④

~~$59x = 2495$~~

④ - ③ $-35x + 20y = -155$

$24x + 20y = 140$

$-59x = -295$

$x = 0.2$

⑥ $10p^3q^2 - 5p^2q + 15p^4q \rightarrow 5p^2q + 15p^4q = 20p^3q^2$

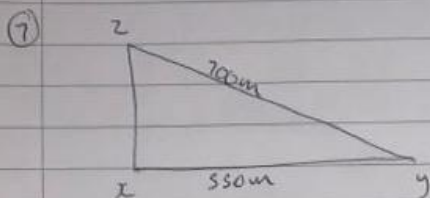
i) $10x \cancel{p} \times \cancel{p} \times \cancel{p} \times \cancel{p} \times q \times q$

$5 \times \cancel{p} \times \cancel{p} \times \cancel{p} \times q$

~~$10p^3q^2 - 5p^2q + 15p^4q$~~

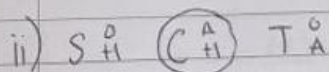
ii) $2x^2y - 4xy^2 = -2x^2y - 2xy^2$

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$$zy^2 - xy^2 = zx^2$$

i) $700^2 - 550^2 = zx^2$
 $zx^2 = 187500$
 $\sqrt{187500} = zx^2 = 433m$
 $zx = 433m$



$$\cos^{-1}\left(\frac{550}{700}\right) = 38.21^\circ$$