

ACHA 3000
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(i) $x^4 \times x^6 \times x = 3x^{10}$

(ii) $2x^2 \times 3x^3 \times 2x = 7x^5$

(iii) $\frac{x^4 \times x^3 \times x^2}{x^9} = \frac{3x^9}{x^9} = 3x$

(iv) $(3x^2)^3 = 3x^6$

(v) $\sqrt{x} \times \sqrt{x} = x^{\frac{1}{2} + \frac{1}{2}} = x^1 = x$

2)

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

$\{15x + 12x + 9 + 2\}$

$3x = 11$

$x = \frac{11}{3} \quad x = 3.60$

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

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

$3(8x^2) = 6(2)$

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

$3(21x - 3) = 6(6x + 18)$

$(21x + 6x)(18 - 3)$

$27x = 15$

$\frac{27}{15} = 1.80 \quad \boxed{x = 1.8}$

$$(iii) \frac{5x+3}{4} = \frac{2x+1}{1} = \frac{8x+4}{45x+12} = 5.6x+3$$

$$x = 5.6x + 3$$

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$$(i) x^2 + 10x + 21 = 0$$

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

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

$$\boxed{x = -7} \quad \boxed{x = -3}$$

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

$$(x-3)(x-1) = 0$$

$$x-3=0 \quad x-1=0$$

$$\boxed{x = 3} \quad \boxed{x = 1}$$

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

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

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

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

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

$$(x+8)(x-8)$$

$$x+8=0 \quad x-8=0$$

$$\boxed{x=-8} \quad \boxed{x=8}$$

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

$$(2x+ \quad)(x+ \quad)$$

$$4 \quad 14x^2 + 3x = 11$$

$$14x^2 + 3x - 11 = 0$$

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

$$x = \frac{-3 \pm \sqrt{9 + 616}}{28}$$

$$x = \frac{-(3) \pm \sqrt{625}}{28}$$

~~$$x = \frac{-3 \pm \sqrt{4861}}{28}$$~~

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

$$x = \frac{-3 + 25}{28} = 0.79 \quad \boxed{x = 0.79}$$

$$x = \frac{-3 - 25}{28} = -1 \quad \boxed{x = -1}$$

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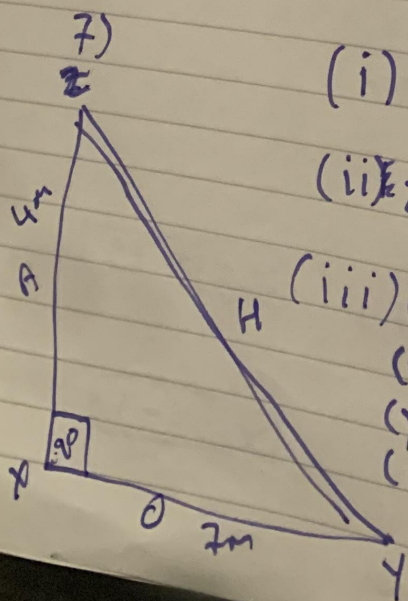
$$\begin{aligned} 5) \quad 5x + 3y &= 39 \times 2 \\ 8x - 2y &= 42 \times 3 \end{aligned}$$

$$\begin{aligned} +10x + 6y &= 378 \\ 24x + 6y &= 126 \end{aligned}$$

$$34x = 204$$

$$x = \frac{204}{34} = 6 \quad \boxed{x = 6}$$

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



$$(i) \hat{y} = \tan^{-1} \hat{y} = \left(\frac{4}{7}\right) = \boxed{29.74}$$

$$(ii) \hat{z} = \tan^{-1} \hat{z} = \left(\frac{7}{4}\right) = \boxed{60.26}$$

$$\begin{aligned} (iii) (yz)^2 &= 4^2 + 7^2 \\ (yz)^2 &= 16 + 49 \\ (yz)^2 &= 65 \\ (yz) &= \sqrt{65} \end{aligned} \quad \boxed{8.06}$$

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

$$(ii) x$$