

Maths Mock

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① i) $x^2 + 8x + 15 = 0$ $5 + 3 = 8$ $5 \times 3 = 15$

$\Rightarrow (x+5)(x+3) \therefore \boxed{x = -5, x = -3}$

ii) $x^2 - 225 = 0$ $15 + -15 = 0$ $15 \times -15 = -225$

$\Rightarrow (x+15)(x-15) \therefore \boxed{x = 15, x = -15}$

iii) $x^2 + 11x + 30 = 0$ $5 + 6 = 11$ $5 \times 6 = 30$

$\Rightarrow (x+5)(x+6) \therefore \boxed{x = -5, x = -6}$

iv) $x^2 - 6x + 8 = 0$ $-4 + -2 = -6$ $-4 \times -2 = 8$

$\Rightarrow (x-4)(x-2) \therefore \boxed{x = 4, x = 2}$

v) $2x^2 + 9x + 7 = 0$

	$2x$	7
x	$2x^2$	$7x$
1	$2x$	7

$\Rightarrow (2x+7)(x+1) \therefore \boxed{x = -3.5, x = -1}$

② $12x^2 + 5x = 7$

$\Rightarrow 12x^2 + 5x - 7 = 0$

$\Rightarrow \frac{-5 \pm \sqrt{25 - (4 \times 12 \times -7)}}{24}$

$\Rightarrow \frac{-5 \pm \sqrt{361}}{24} \Rightarrow \boxed{x = 0.58, x = -1.00}$

$$\begin{aligned} \textcircled{3} \quad 5x + 2y &= 22 \quad \textcircled{1} \\ 4x + 3y &= 19 \quad \textcircled{2} \end{aligned}$$

$$\times 3 \quad 15x + 6y = 66$$

$$\times 2 \quad 8x + 6y = 38$$

$$\textcircled{1} - \textcircled{2} \Rightarrow 7x = 28 \quad 28 \div 7 = 4 \therefore \textcircled{x=4}$$

$$\Rightarrow 5(4) + 2y = 22 \Rightarrow 20 + 2y = 22 \therefore \textcircled{y=1}$$

$$\textcircled{4} \text{ i) } x^8 \times x \times x^9$$

$$8 + 1 + 9 = 18$$

$$\Rightarrow \textcircled{x^{18}} = \del{x^{18}}$$

$$\text{ii) } (2x^3)^3$$

$$\Rightarrow 2^3 = 8$$

$$\Rightarrow 3 \times 3 = 9 \therefore (2x^3)^3 \Rightarrow \textcircled{8x^9}$$

$$\text{iii) } \frac{x^{12} \times x^8}{x}$$

$$\Rightarrow x^{12} \times x^8 = x^{20}$$

$$\Rightarrow x^{20} \div x = \textcircled{x^{19}}$$

$$\text{iv) } 5x^2 \times 3x^4$$

$$\Rightarrow 5 \times 3 = 15 \Rightarrow 15x$$

$$\Rightarrow 2 + 4 = 6$$

$$\Rightarrow = \textcircled{15x^6}$$

$$v) \frac{10x^5}{2x^2}$$

$$\Rightarrow 10 \div 2 = 5x$$

$$\Rightarrow 5 - 2 = 3$$

$$\Rightarrow = \boxed{5x^3}$$

$$(5) i) 2(x^2 + y^2) + x^2(x - y) + 3xy - x^3$$

$$\Rightarrow 2x^2 + 2y^2 + x^3 - \cancel{x^2y} + 3xy - x^3$$

$$\Rightarrow \cancel{2x^2 + 2y^2 - x^3} + 3xy = \boxed{2x^2 + 2y^2 - x^2y + 3xy}$$

$$(6) i) 5(2x + 1) = 4(3x + 2)$$

$$\Rightarrow 10x + 5 = 12x + 8$$

$$\Rightarrow 10x = 12x + 3$$

$$\Rightarrow 2x + 3 = 0$$

$$\Rightarrow -3 = 2x \therefore \boxed{x = -\frac{3}{2}}$$

$$ii) 12x + 5 = 4x - 1$$

$$\Rightarrow 12x + 6 = 4x$$

$$\Rightarrow 8x + 6 = 0$$

$$\Rightarrow 8x = -6$$

$$\Rightarrow x = -\frac{6}{8} \Rightarrow \boxed{-\frac{3}{4} = x}$$

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

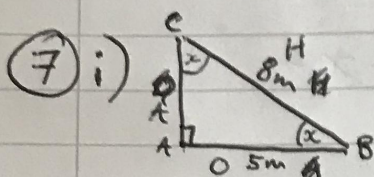
$$\Rightarrow \text{cross multiply} \Rightarrow (4x-1) \times 2 = (5x+2) \times 3$$

$$\Rightarrow 8x - 2 = 15x + 6$$

$$\Rightarrow 8x = 15x + 8$$

$$\Rightarrow 0 = 7x + 8$$

$$\Rightarrow 7x = -8 \therefore x = -\frac{8}{7} \text{ or } \boxed{-1\frac{1}{7}}$$



$$\text{Angle B} \Rightarrow \cos(x) = \frac{5}{8}$$

$$5 \div 8 = 0.625 \Rightarrow \cos^{-1}(0.625) = \boxed{51.32^\circ}$$

$$\text{ii) Angle C} \Rightarrow \sin(x) = \frac{5}{8}$$

$$5 \div 8 = 0.625 \Rightarrow \sin^{-1}(0.625) = \boxed{38.68^\circ}$$

$$\text{iii) Length AC} \Rightarrow \cos(38.68) = \frac{AC}{8}$$

$$\Rightarrow 8 \times \cos(38.68) = 6.25\text{m}$$

$$\vec{AC} = \boxed{6.25\text{m}}$$