

1) Mock exam Sam Cashell

(i) $x^2 + 8x + 15 = 0$

$$3 \times 5 = 15$$

$$3 + 5 = 8$$

$$(x+3)(x+5) = 0$$
$$x^2 + 5x + 3x + 15$$
$$= 8x$$

$$x+3=0 \quad x+5=0$$

$$\boxed{x=-3} \quad \boxed{x=-5}$$

(ii) $x^2 - 225 = 0$

$$\pm\sqrt{225} = 15$$

$$(x+15)(x-15) = 0$$

$$x^2 - 15x + 15x - 225$$

$$x^2 - 225$$

$$x+15=0 \quad x-15=0$$

$$x=-15 \quad x=15$$

$$x = \pm\sqrt{225}$$

$$\boxed{x = \pm 15}$$

(iii) $x^2 + 11x + 30 = 0$

$$5 \times 6 = 30$$

$$5 + 6 = 11$$

$$(x+5)(x+6) = 0$$
$$x^2 + 6x + 5x + 30 = 0$$
$$= 11x$$

$$x+5=0 \quad x+6=0$$

$$\boxed{x=-5} \quad \boxed{x=-6}$$

6)

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

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

$$5-8 = 12x-10x$$

$$-3 = 2x$$

$$-1.5 = x$$

(ii)

$$12x+15 = 4x-1$$

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

$$8x = 4$$

$$x = 0.5$$

(iii)

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

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

$$-2-6 = 15x-8x$$

$$-8 = 7x$$

$$-1.14 = x$$

$$4) (i) x^8 \times x \times x^9 = x^{17}$$

$$(ii) (2x^3)^3 = 8x^9$$

$$(iii) \frac{x^{12} \times x^8}{x} = \frac{x^{20}}{x} = x^{19}$$

$$(iv) 5x^2 \times 3x^4 = 15x^6$$

$$(v) \frac{10x^5}{2x^2} = 5x^{2.5}$$

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

$$2x^2 + 2y^2 +$$

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

$$2x^2 + 2y^2 + x^3 - x^2y + 3xy - x^3$$

$$(iv) x^2 - 6x + 8 = 0$$

$$4 \times 2 = 8$$

$$4 + 2 = 6$$

$$(x-4)(x-2)$$

$$x^2 - 2x - 4x + 8 = 0$$

$$\quad \quad \quad \underline{-6x}$$

$$\begin{cases} x-4=0 & x-2=0 \\ \boxed{x=4} & \boxed{x=2} \end{cases}$$

$$(V) 2x^2 + 9x + 7 = 0$$

$$(2x+1)(x+7) = 0$$

$$2x^2 + 14x + x + 7 = 0 \quad X$$

~~$$(2x+7)(x+1) = 0$$~~
~~$$2x^2 + 2x + 7x + 7 = 0$$~~
~~$$2x^2 + 9x + 7 = 0$$~~

↓ ☺

~~$$(2x+7)(x+1) = 0$$~~
~~$$2x^2 + 2x + 7x + 7 = 0$$~~
~~$$2x^2 + 9x + 7 = 0$$~~
~~$$(2x+7)(x+1)$$~~
~~$$2x^2 + 2x + 7x + 7 = 0$$~~
~~$$2x^2 + 9x + 7 = 0$$~~

~~$$(2x+1)(x+7)$$~~
~~$$2x^2 + 2x + 7x + 7 = 0$$~~
~~$$2x^2 + 9x + 7 = 0$$~~

↑ ☺

$$(2x+7)(x+1) = 0$$

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

$$\quad \quad \quad \underline{9x}$$

$$2x+7=0 \quad x+1=0$$

$$2x = -7$$

$$\boxed{x = -3.5}$$

$$\boxed{x = -1}$$

2)

$$\underset{A}{12}x^2 + \underset{B}{5}x = \underset{C}{7}$$

$$\underset{A}{12}x^2 + \underset{B}{5}x - \underset{C}{7} = 0$$

$$x = \frac{-\frac{5}{5} \pm \sqrt{\frac{5^2}{5^2} - 4(\frac{12}{5})(\frac{-7}{5})}}{2(\frac{12}{5})}$$

$$x = \frac{5 \pm \sqrt{25 + 336}}{24}$$

$$x = \frac{5 \pm \sqrt{361}}{24}$$

$$x = \frac{5 \pm 19}{24}$$

$$x = \frac{5 + 19}{24}$$

$$x = 1.00$$

$$x = \frac{5 - 19}{24}$$

$$x = -0.58$$