

1. i) $x^4 \times x^6 \times x = x^{11}$

ii) $2x^2 \times 3x^3 \times 2x = 7x^6$

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

iv) $(3x^2)^3 = 27x^6$

v) $\sqrt{x} + \sqrt{x} = \sqrt[2]{x}$

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

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

$x^2 + \underbrace{3x + 7x}_{10x} + 21 = 0$

$x+7=0$

$x+3=0$

$(x=-7)$

$(x=-3)$

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

$3x = 11$

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

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

$21x-3 = 6x+18$

$15x = 21$

$x = \frac{21}{15} = \frac{7}{5}$

iii) $\frac{5x+3}{4} = \frac{2x-1}{9}$

$4 \times 9 = 36$

$\frac{\cancel{36}(5x+3)}{4} = \frac{\cancel{36}(2x-1)}{9}$

3

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

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

$$x^2 + \frac{3x+7x}{10x} + 21 = 0$$

$$x+7=0$$

$$x+3=0$$

$$(x=-7)$$

$$(x=-3)$$

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

$$(x-2)(x-1) = 0$$

$$x^2 - \frac{x-2x}{-3x} + 2 = 0$$

$$x-2=0$$

$$x-1=0$$

$$(x=2)$$

$$(x=1)$$

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

$$15x = 21$$

$$x = \frac{21}{15} = \frac{7}{5}$$

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ii)

$$\frac{5x+3}{4} = \frac{2x-1}{9}$$

$$4 \times 9 = 36$$

$$\frac{36(5x+3)}{4} = \frac{36(2x-1)}{9}$$

$$9(5x+3) = 4(2x-1)$$

$$45x + 27 = 8x - 4$$

$$37x = -31$$

$$x = \frac{-31}{37}$$

4.

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

2.d.p

$$\begin{matrix} a & b & c \\ 14x^2 & + 3x & - 11 = 0 \end{matrix}$$

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$x-2=0$

$x-1=0$

$x=2$

$x=1$

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

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

$x^2 + 10x + 2x + 20 = 0$
 $12x$

$x+2=0$

$x+10=0$

$x=-2$

$x=-10$

iv) $x^2 - 64 = 0$

$x^2 = 64$

$x = \sqrt{64}$

$x = 8$

$x = -8$

4.

$14x^2 + 3x = 11$

2. d. p

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

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

$x = 0.79$

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

$x = -1$

5.

$5x + 3y = 39$ ① $\times 2$

$8x - 2y = 42$ ② $\times 3$

$10x + 6y = 78$ ③



$$x^2 = 64$$

$$x = \sqrt{64}$$

$$\begin{aligned} x &= 8 \\ x &= -8 \end{aligned}$$

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

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

$$2x^2 + 4x + 5x + 10 = 0$$

$$4x$$

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

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

$$x = -2$$

6.

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

$$10x^2 - 5y^2 - x^4 + \cancel{x^2y} - \cancel{x^2y} - x^4$$

5.

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$$5x + 3y = 39 \quad (1) \quad \times 2$$

$$8x - 2y = 42 \quad (2) \quad \times 3$$

$$10x + 6y = 78 \quad (3)$$

$$+ 24x - 6y = 126 \quad (4)$$

$$34x = 204$$

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

①

$$5(6) + 3y = 39$$

$$30 + 3y = 39$$

$$3y = 39 - 30$$

$$3y = 9$$

$$y = 3$$

6.

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

$$10x^2 - 5y^2 - x^4 + x^2y - x^2y - x^4$$

$$10x^2 - 5y^2 - x^8$$

8.

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

$$ii) 1 = x^0$$

$$3y = 39 - 30$$

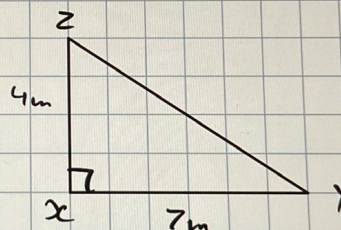
$$3y = 9$$

$$y = 3$$

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7.

i) Angle Y ii) Angle Z iii) YZ using Pythagoras' theorem



2. dp

$$i) \tan Y = \frac{4}{7}$$

$$\tan^{-1}\left(\frac{4}{7}\right) = Y$$

$$Y = 29.74^\circ$$

$$ii) 180^\circ - 90^\circ - 29.74^\circ = Z$$