

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

$$(x+3)(x+7)$$

$$3 \times 7 = 21$$

$$3 + 7 = 10$$

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

$$x=-3$$

$$x=-7$$

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

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

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

$$x=-1 \quad x=-2$$

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

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

$$2 \times 10 = 20$$

$$2 + 10 = 12$$

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

$$x=-2$$

$$x=-10$$

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

$$\sqrt{64} = 8$$

$$x=8 \quad x=-8$$

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

$$(2x+10)(x+1)=0$$

$$2x+10=0 \quad x+1=0$$

$$10 \times 1$$

$$1 \times 1$$

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

$$4 + 6 = 10$$
$$x=1 \quad 10 + 1 = 11$$

(ii) $2x^2 \times 3x^3 \times 2x$

~~$2 \times 3 \times 2 = 12$~~

$$2 \times 2 = 2^{1+1}$$
$$= x^2 \times 3x^3 \times 2^2x$$

$$x^2 \times x^3 \times x = x^{2+3+1}$$
$$= 3 \times 2^2 \times x^{2+3+1}$$

$$2 + 3 + 1 = 6$$
$$= 3 \times 2^2 \times x^6$$

$$2^2 = 4 \quad x = 4x^6$$
$$3 \times 4 = 12$$

$$x = 12x^6$$

(iii) $\frac{x^4 \times x^3 \times x^2}{x^9} = 1$

$$4 + 3 + 2 = 9 = x^9 \div x^9 = 1$$

(iv) $(3x^3)^3$

$$3^3 = 27$$

$$5x + 3y = 39$$

$$8x - 2y = 42$$

$$50x = 39 - 3y$$

$$50x = -3y + 39$$

$$8x - 2y = 42$$

$$8\left(\frac{-3}{5}y + \frac{39}{5}\right) - 2y = 42$$

$$3x + 5 = 15 \quad 31x = 105$$

$$15 + 143 + 2 = 312$$

$$-3 - 2 + 39 = 34$$

$$\frac{-34}{5}y + \frac{312}{5} = 42$$

x

$$x = \frac{-3}{5}y + \frac{34}{5}$$

$$x = \frac{-3}{5}(3) + \frac{34}{5}$$

$$x = 6$$

$$x = 6 \quad y = 3$$

$$\frac{50x}{5} = \frac{-3y + 39}{5}$$

$$x = \frac{-3}{5}y + \frac{39}{5}$$

$$-34y + 312 = 210$$

$$\frac{-34}{5}y = -102$$

$$\frac{-34}{5}y = \frac{-102}{5}$$

$$\frac{-34}{5}y = \frac{-34}{5}$$

$$y = 3$$

$$(v) \sqrt{x} \times \sqrt{x} = x$$

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

$$15x = 12x + 11$$

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

$$15x \div 3 = 3x = 11$$

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

$$3 \times 7 = 21$$

$$6x \times x = 6x$$

$$3 \times -1 = -3$$

$$6 \times 3 = 18$$

$$21x - 3$$

$$6x + 18$$

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

$$18 + 3 = 21$$

$$21x = 6x + 21$$

$$21 - 6 = 15$$

$$15x = 21$$

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

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

(iii)

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

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

$$\begin{aligned} 5 \times 2 &= 10 \\ &= 10x^2 - 5y^2 \\ &= 10x^2 - 5y^2 - x^2(x^2 - y) - x^2y - x^4 \end{aligned}$$

$$\begin{aligned} &-x^2(x^2 - y) \\ &= x^2x^2 - (-x^2)y \\ &= x^2x^2 + x^2y \\ &= x^2x^2 = x^4 \\ &= -x^4 + x^2y \end{aligned}$$

$$= (10x^2 - 5y^2) - x^4 + x^2y - x^2y - x^4$$

$$\begin{aligned} &= -x^4 - x^4 = -2x^4 \\ &= x^2y - x^2y = 0 \\ &= 10x^2 \\ &= -5y^2 \end{aligned}$$

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