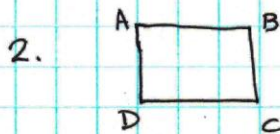


$$\begin{array}{r}
 x^2 + x - 6 \\
 2x-1 \overline{) 2x^3 + x^2 - 13x + 6} \\
 \underline{-(2x^3 - x^2)} \\
 2x^2 - 13x \\
 \underline{-(2x^2 - x)} \\
 -12x + 6 \\
 \underline{-(-12x + 6)} \\
 0
 \end{array}$$

$$\begin{aligned}
 V &= L \times W \times H \\
 \frac{V}{H} &= L \times W
 \end{aligned}$$

$$\begin{aligned}
 \therefore L \times W &= x^2 + x - 6 \\
 \text{factor } x^2 + x - 6 & \quad \left. \begin{array}{l} mxn = -6 \\ mn = 1 \end{array} \right\} +3, -2 \\
 (x+3)(x-2)
 \end{aligned}$$

Dimensions of the base = $(x+3)$ and $(x-2)$



$$A = 2x^2 - 11x + 12$$

$$\begin{aligned}
 \text{factor: } mxn &= 24 \\
 mn &= -11 \\
 & -8, -3
 \end{aligned}$$

$$A = 2x^2 - 8x - 3x + 12$$

$$A = 2x(x-4) - 3(x-4)$$

$$A = (x-4)(2x-3)$$

\therefore Dimensions of ABCD are $(x-4)$ & $(2x-3)$
 Add 4 to each: $x-4+4$, $2x-3+4$
 New rectangle: x , $2x+1$

$$\begin{aligned}
 \text{Area, New rectangle} &= x(2x+1) \\
 &= (2x^2 + x)
 \end{aligned}$$

3. a) $6x^2 - 2x - 4$ $\left. \begin{array}{l} mxn = -24 \\ mn = -2 \\ -6, 4 \end{array} \right\}$

$$6x^2 - 6x + 4x - 4$$

$$6x(x-1) + 4(x-1)$$

$$(x-1)(6x+4)$$

$$(x-1)(2)(3x+2)$$

b) $7x^5y^2 + 21x^2y^3 + 14xy^4$

$$7xy^2(x^4 + 3xy + 2y^2)$$

c) $6x^2(3x-2) + 2x(3x-2) - 4(3x-2)$

$$(3x-2)(6x^2 + 2x - 4)$$

$$(3x-2)(6x^2 + 6x - 4x - 4)$$

$$(3x-2)(6x(x+1) - 4(x+1))$$

$$(3x-2)(x+1)(6x-4)$$

$$2(3x-2)(x+1)(3x-2)$$

$$2(x+1)(3x-2)^2$$

d) $15xy + 20y^2 - 18x - 24y$

$$5y(3x+4y) - 6(3x+4y)$$

$$(3x+4y)(5y-6)$$

$$e) \quad x^8 - 256$$

$$(x^4 + 16)(x^4 - 16)$$

$$(x^4 + 16)(x^2 + 4)(x^2 - 4)$$

$$(x^4 + 16)(x^2 + 4)(x+2)(x-2)$$

$$f) \quad (a+b)^2 - 16$$

$$(a+b+4)(a+b-4)$$

$$g) \quad 4x^2 + 12x + 9$$

$$\sqrt{4x^2} = 2x \quad 2 \cdot 3 = 6x \quad \sqrt{9} = 3$$

$$12x = 2 \cdot 6x$$

$$\therefore \text{P.S.T}$$

$$(2x+3)^2$$

$$h) \quad 8x^2 - 26x + 15$$

$$8x^2 - 6x - 20x + 15$$

$$2x(4x-3) - 5(4x-3)$$

$$(4x-3)(2x-5)$$

$$4. \quad a) \quad 5x^2 - 3x = 0$$

$$x(5x-3) = 0$$

$$x = 0 \quad \text{or} \quad 5x - 3 = 0$$

$$5x = 3$$

$$x = \frac{3}{5} \text{ or } 0.6$$

$$\therefore x = \{0, \frac{3}{5}\}$$

$$b) \quad 6x^2 - 13x + 2 = 0$$

$$6x^2 - 12x - x + 2 = 0$$

$$6x(x-2) - 1(x-2) = 0$$

$$(x-2)(6x-1) = 0$$

$$x-2 = 0 \quad \text{or} \quad 6x-1 = 0$$

$$x = 2 \quad \text{or} \quad 6x = 1$$

$$x = \frac{1}{6}$$

$$\therefore x = \{\frac{1}{6}, 2\}$$

$$5. \quad \square \quad \text{Area} = x^2$$

$$\text{Area} = 2x^2 - 7x - 30$$

$$x^2 = 2x^2 - 7x - 30$$

$$0 = x^2 - 7x - 30$$

$$0 = (x-10)(x+3)$$

$$x-10 = 0 \quad \text{or} \quad x+3 = 0$$

$$x = 10 \quad \text{or} \quad x = -3 \quad \times$$

$$\text{Rectangle: } \left. \begin{array}{l} 2x^2 - 7x - 30 \\ 2x^2 - 12x + 5x - 30 \\ 2x(x-6) + 5(x-6) \\ (x-6)(2x+5) \end{array} \right\} \begin{array}{l} m \times n = -60 \\ m+n = -7 \end{array} \quad -12, 5$$

$$\therefore \text{Dimensions of rectangle are } x-6 \text{ \& } 2x+5$$

$$x=10 \quad \therefore \quad x-6 = 4 \text{ cm}$$

$$2x+5 = 25 \text{ cm}$$

$$\text{Perimeter of rectangle} = 2(4) + 2(25)$$

$$= 58 \text{ cm}$$

6.

	Now	Then
Father	$3x+5$	$3x-3$
Daughter	x	$x-8$

$$(x-8)(3x-3) = 180$$

$$3x^2 - 3x - 24x + 24 = 180$$

$$3x^2 - 27x - 156 = 0$$

$$3(x^2 - 9x - 52) = 0$$

 $\div 3$
 $\div 3$

$$x^2 - 9x - 52 = 0$$

$$(x+4)(x-13) = 0$$

$$x+4=0 \text{ or } x-13=0$$

$$x = -4$$

$$x = 13$$

Today: Daughter is 13, Dad is $3(13)+5 = 44$

In 10 years: Daughter will be 23.
Father will be 54.