

$$1) H(x) = x^4 + x^3 - x^2 + x - 2 = (x-1)(x+2)(x^2+1)$$

$$\begin{array}{r|rrrrr} & 1 & 1 & -1 & 1 & -2 \\ 1 & & 1 & 2 & 1 & 2 \\ \hline & 1 & 2 & 1 & 2 & 0 \\ -2 & & -2 & 0 & -2 & \\ \hline & 1 & 0 & 1 & 0 & \end{array}$$

$$x^2+1=0 \quad x=\pm\sqrt{-1} \notin \mathbb{R}$$

$$b) H(x)=0 \rightarrow x=1 \quad x=-2$$

$$2) \text{ Resto} = 0 = P(-2) = 16 - 8m + 16 - 8 = 0 \quad 8m = 24 \quad \boxed{m=3}$$

$$\begin{array}{r|rrrrr} -2 & 1 & 3 & 4 & 0 & -8 \\ & & -2 & -2 & -4 & 8 \\ \hline & 1 & 1 & 2 & -4 & 0 \end{array} \quad \text{Comprobacion}$$

$$3) a) (3x^2 - 5x)^2 - (3x^2 + 5x)^2 - 60x^3 = 9x^4 - 30x^3 + 25x^2 - (9x^4 + 30x^3 + 25x^2) - 60x^3 \\ = -60x^3 - 60x^3 = -120x^3$$

$$b) \left(\frac{x-2}{x^2-1} - \frac{3}{x+1} \right) : \frac{x+3}{x^2-x} = \frac{x-2-3(x-1)}{x^2-1} : \frac{x+3}{x^2-x} = \frac{-2x+1}{x^2-1} : \frac{x+3}{x^2-x} \\ = \frac{(-2x+1)(x^2-x)}{(x^2-1)(x+3)} = \frac{(-2x+1)x(x-1)}{(x+1)(x-1)(x+3)} = \frac{(-2x+1)x}{(x+1)(x+3)}$$

$$4) a) x^4 - 3x^2 - 4 = 0 \quad x^2 = t \quad t^2 - 3t - 4 = 0 \\ t = \frac{3 \pm \sqrt{9+16}}{2} = \frac{3 \pm 5}{2} = \begin{cases} 4 \\ -1 \end{cases} \quad x^2 = 4 \begin{cases} x_1 = 2 \\ x_2 = -2 \end{cases}$$

$$6) p(x) = 2(x+5)^2(x^2+1) \quad x^2 = -1 \quad x = \pm\sqrt{-1} \notin \mathbb{R}$$

$$b) 2^{2x-3} = 16$$

$$2^{2x-3} = 2^4$$

$$2x-3=4 \quad \boxed{x = 7/2}$$

$$d) \log_2(x) + \log_2(x+4) = 5 \quad \log_2(x(x+4)) = 5$$

$$x(x+4) = 2^5$$

$$x^2 + 4x - 32 = 0$$

$$\boxed{x = 4}$$

$$x = -8$$

$x = -8$ No solution $\log_2(-8) \notin \mathbb{R}$

$$d) (\sqrt{2x-1})^2 = (6x-5)^2 \quad 2x-1 = 36x^2 - 60x + 25$$

$$36x^2 - 62x + 26 = 0$$

$$18x^2 - 31x + 13 = 0$$

$$x = \frac{31 \pm \sqrt{31^2 - 4 \cdot 18 \cdot 13}}{2 \cdot 18} < \begin{cases} 1 \rightarrow \sqrt{2 \cdot 1 - 1} = 6 \cdot 1 - 5 \quad 1 = 1 \\ \frac{13}{18} \rightarrow \sqrt{2 \cdot \frac{13}{18} - 1} = 6 \cdot \frac{13}{18} - 5 \end{cases}$$

$$\frac{2}{3} = \frac{13}{3} - 5 \quad \frac{2}{3} \neq -\frac{2}{3}$$

$$e) \frac{x}{x-1} - \frac{x+2}{x} + x = 2$$

$$\frac{x \cdot x - (x+2)(x-1) + x \cdot x(x-1)}{(x-1)x} = \frac{2x(x-1)}{(x-1)x}$$

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

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

$$\begin{array}{r|rrrr} 2 & 1 & -3 & 1 & 2 \\ & & 2 & -2 & -2 \\ \hline & 1 & -1 & -1 & 0 \end{array}$$

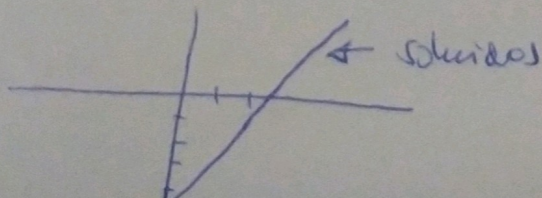
$$x^2 - x - 1 = 0$$

$$x = \frac{1 \pm \sqrt{5}}{2}$$

$$s) \begin{cases} 2x - y = 5 \\ -4x + 2y = -10 \end{cases} \quad \frac{2}{-4} = \frac{-1}{2} = \frac{5}{-10} \quad \text{SCJ} \quad \text{no solution}$$

$$y = 2x - 5$$

$$\begin{array}{r|l} x & y \\ 0 & -5 \\ 2 & -1 \end{array}$$



$$x_1 = \frac{1 + \sqrt{5}}{2}$$

$$x_2 = \frac{1 - \sqrt{5}}{2}$$

$$x_3 = -2$$