1.-

a) $x^3 * x^2 = x^5$

b) $(2x^2)^3 = 8x^6$

c) $\dfrac{y^3}{y^{-4}} = y^7$

d) $\dfrac{2^4 * 3^4}{6^2} = \dfrac{2^4 * 3^4}{2^2 * 3^2} = 2^2 * 3^2 = 4 * 9 = 36$

2) Calcular la pendiente de la recta que pasa por los puntos $P_1(1,6)$ $P_2(3,2)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2-6}{3-1} = \frac{-4}{2} = -2$$

3) Resolver los siguientes limites

a) $\lim\limits_{x \to 3} x^3 - 2x^2 + 8x - 32 = (3)^3 - 2(3)^2 + 8(3) - 32 = \underline{1}$

b) $\lim\limits_{x \to 9} \dfrac{\sqrt{x} - 3}{x - 9}$

$$\frac{\sqrt{x} - 3}{x - 9} = \left(\frac{\sqrt{x} - 3}{x - 9}\right)\left(\frac{\sqrt{x} + 3}{\sqrt{x} + 3}\right) = \frac{x - 9}{(x-9)(\sqrt{x} + 3)} = \frac{1}{\sqrt{x} + 3}$$

$$\therefore \lim\limits_{x \to 9} \frac{\sqrt{x} - 3}{x - 9} = \lim\limits_{x \to 9} \frac{1}{\sqrt{x} + 3} = \frac{1}{\sqrt{9} + 3} = \frac{1}{6}$$

4) Calcular la derivada

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

$f'(x) = 2(3x^3 - 2)(9x^2)(x^2 - 4x + 4) + (3x^3 - 2)^2 (2x - 4)$

$\quad\quad = 18x^2(3x^3 - 2)(x^2 - 4x + 4) + (3x^3 - 2)^2(2x - 4)$

b)

$$\frac{\text{sen}\,(x^2-x)}{(x-1)^2}$$

$$f'(x) = \frac{(x-1)^2 \cos(x^2-x)\,(2x-1) - 2(x-1)\,\text{sen}\,(x^2-x)}{(x-1)^4}$$

$$= \frac{(2x-1)\cos(x^2-x)}{(x-1)^2} - \frac{2\,\text{sen}\,(v^2-x)}{(x-1)^3}$$