PREGUNTA 1: $y = x^2 - 8x + 12$

a) $TVM\, f\,[1,7] = \dfrac{f(7)-f(1)}{(7-1)} = \dfrac{5-5}{6} = \dfrac{0}{6} = 0$

b) $TVM\, f\,[-4,-2] = \dfrac{f(-2)-f(-4)}{-2-(-4)} = \dfrac{32-60}{2} = \dfrac{-28}{2} = -14$

PREGUNTA 2:

$$f'(-2) = \lim_{h\to 0} \frac{f(-2+h)-f(-2)}{h} = \lim_{h\to 0} \frac{\frac{2(-2+h)-3}{5} + \frac{7}{5}}{h} = \lim_{h\to 0} \frac{-4+2h-3+7}{5h} =$$

$$= \lim_{h\to 0} \frac{2\cancel{h}}{5\cancel{h}} = \lim_{h\to 0} \frac{2}{5} = \frac{2}{5}$$

PREGUNTA 3:

a) $$\lim_{h\to 0} \frac{f(x+h)-f(x)}{h} = \lim_{h\to 0} \frac{(x+h)^3 - 4(x+h) - x^3 + 4x}{h} =$$

$$= \lim_{h\to 0} \frac{\cancel{x^3} + h^3 + 3x^2h + 3xh^2 - \cancel{4x} - 4h - \cancel{x^3} + \cancel{4x}}{h} = \lim_{h\to 0} \frac{h^3 + 3x^2h + 3h^2x - 4h}{h} =$$

$$= \lim_{h\to 0} (h^2 + 3hx + 3x^2 - 4) = 3x^2 - 4$$

b) $f'(x) = 3x^2 - 4 = 8 \Rightarrow 3x^2 = 12 \Leftrightarrow x^2 = 4 \Leftrightarrow x = \pm 2$

c) PUNTOS DE CORTE:

eje x : $x^3 - 4x = 0 \Leftrightarrow x(x^2-4) = 0$ → $x = 0$; $x^2 - 4 = 0$ → $x = +2$; $x = -2$

eje y : $f(0) = 0$

SIMETRÍA : $f(-x) = -x^3 + 4x = -f(x) \Rightarrow$ IMPAR

$\lim_{x\to +\infty} f(x) = +\infty$; $\lim_{x\to -\infty} f(x) = -\infty$

CREC-DECREC:

$f'(x) = 3x^2 - 4$; $3x^2 - 4 = 0 \Rightarrow x = \pm\sqrt{\frac{4}{3}} = \pm \frac{2}{\sqrt{3}} = \pm \frac{2\sqrt{3}}{3} \simeq 1{,}15$

	$-\infty$ a $-\frac{2\sqrt{3}}{3}$	$-\frac{2\sqrt{3}}{3}$ a $+\frac{2\sqrt{3}}{3}$	$+\frac{2\sqrt{3}}{3}$ a $+\infty$
$f'(x)$	+	−	+
	↗	↘	↗

MAX (en $-\frac{2\sqrt{3}}{3}$) MÍN (en $+\frac{2\sqrt{3}}{3}$)