EXAMEN IV 4º ESO ACADÉMICAS. POLINOMIOS.

1.

a) $2x^3+x^2+2 : x+2$

	2	1	0	2
-2		-4	6	-12
	2	-3	6	-10

Cociente: $2x^2-3x+6$

Resto: -10

b) $x^5-6x^3-25x : x^2+3x$

$$\begin{array}{r|l} x^5-6x^3-25x & x^2+3x \\ \hline -x^5-3x^4 & x^3-3x^2+3x-9 \\ \hline -3x^4-6x^3-25x & \\ +3x^4+9x^3 & \\ \hline 3x^3-25x & \\ -3x^3-9x^2 & \\ \hline -9x^2-25x & \\ 9x^2+27x & \\ \hline 2x & \end{array}$$

Cociente: x^3-3x^2+3x-9

Resto: $2x$

2.

$$(4x^2-5)\cdot(2x+1)^2-8x(1-x^2)=(4x^2-5)\cdot(4x^2+4x+1)-8x(1-x^2)=$$

$$=16x^4-20x^2+16x^3-20x+4x^2-5-8x+8x^3=16x^4+24x^3-16x^2-28x-5$$

3.

a) $P(x)=6x^3+13x^2-4$

	6	+13	0	-4
-2		-12	-2	4
	6	+1	-2	0

$\therefore 6x^2+x-2=0 \Rightarrow x=\frac{-1\pm\sqrt{49}}{12}=\frac{-1\pm 7}{12}=\begin{cases}\frac{1}{2}\\ -\frac{2}{3}\end{cases}$

$$\Rightarrow P(x)=6x^3+13x^2-4=(x+2)\cdot 6\cdot\left(x-\tfrac{1}{2}\right)\cdot\left(x+\tfrac{2}{3}\right)=\underline{(x+2)(2x-1)(3x+2)}$$

b) $P(x) = x^4 - x^3 + 2x^2 - 4x - 8 = (x+1)(x-2)(x^2+4)$

	1	-1	2	-4	-8
-1		-1	2	-4	8
	1	-2	4	-8	0
2		2	0	8	
	1	0	4	0	

x^2+4 NO RAÍCES

4. $$\frac{4x^4 - 81x^2}{2x^3 - 7x^2 - 9x} = \frac{x^2(4x^2-81)}{x(2x^2-7x-9)} = \frac{x^2(2x+9)(2x-9)}{x(x+1)2\cdot(x-\frac{9}{2})} = (*)$$

$$2x^2 - 7x - 9 = 0 \Rightarrow x = \frac{7 \pm \sqrt{121}}{4} = \frac{7 \pm 11}{4} = \begin{cases} \frac{9}{2} \\ -1 \end{cases}$$

$$(*) = \frac{x^{\cancel{2}}(2x+9)\cancel{(2x-9)}}{\cancel{x}(x+1)\cancel{(2x-9)}} = \frac{x(2x+9)}{x+1}$$

5. $x^3 - mx^2 + 5x - 2$ divisible por $x+1 \Rightarrow P(-1) = 0$

I.) $\Rightarrow (-1)^3 - m(-1)^2 + 5\cdot(-1) - 2 = 0 \Rightarrow (-1) - m - 5 - 2 = 0 \Rightarrow -1-5-2 = m$

$\Rightarrow \boxed{m = -8}$

II.)

	1	-m	5	-2
-1		-1	m+1	-m-6
	1	-m-1	m+6	-m-6-2

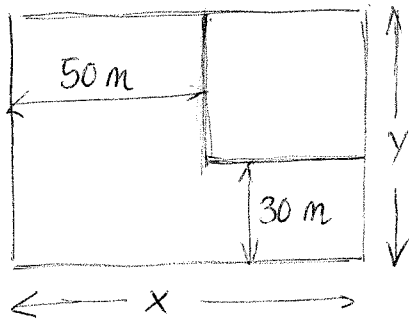
$\Rightarrow -m-6-2 = 0 \Rightarrow \boxed{m = -8}$

6. a) $$\frac{2}{x+3} - \frac{3}{x-3} + \frac{3x+10}{x^2-9} = \frac{2(x-3)}{(x+3)(x-3)} - \frac{3(x+3)}{(x+3)(x-3)} + \frac{3x+10}{(x+3)(x-3)} =$$

$$= \frac{2(x-3) - 3(x+3) + (3x+10)}{(x+3)(x-3)} = \frac{2x-6-3x-9+3x+10}{(x+3)(x-3)} = \frac{2x-5}{(x+3)(x-3)}$$

b) $$\frac{x^2-2x}{12x} \cdot \frac{x^2-4}{3} = \frac{(x^2-2x)\cdot 3}{12x(x^2-4)} = \frac{\cancel{3x}(x-2)}{\cancel{12x}(x-2)(x+2)} = \frac{1}{4(x+2)}$$

7.



Área no edificada $= xy - (x-50)(y-30) =$

$= xy - (xy - 50y - 30x + 1500) =$

$= xy - xy + 50y + 30x - 1500 = \underline{30x + 50y - 1500}$