



COLEGIO ALMA'S
bilingual school

APELLIDOS Y NOMBRE: Comerción Examen Evaluación
CURSO: 4° Básico N° 1ª Evaluación
FECHA: 01-12-2017 ASIGNATURA: Matemáticas

1) a) $\frac{5 \sqrt[3]{5}}{2 \sqrt[3]{5} \sqrt[3]{5}} = \frac{\sqrt[3]{5}}{2}$ b) $\frac{19 \sqrt[3]{5+1}}{2 \sqrt[3]{5-1} \sqrt[3]{5+1}} = \frac{19 \sqrt[3]{5+1}}{19} = \sqrt[3]{5+1}$

2) a) $x = 4^{1/2} \rightarrow x = 2$ b) $\log_{28} 7 - x^2 = 128 \rightarrow x = \sqrt[3]{128} \rightarrow x = 2$

3) a) $\frac{\sqrt[4]{5^3} \cdot 5}{\sqrt[2]{5}} = 5 \sqrt[12]{\frac{5^9}{5^2}} = 5 \sqrt[12]{5^7}$ b) $6\sqrt{3} - 6\sqrt{3} - 5\sqrt{3} + 6\sqrt{3} = \sqrt{3}$

4)
$$\begin{array}{r} 4x^5 + 20x^4 - 18x^3 - 28x^2 + 28x - 6 \\ - 4x^5 - 20x^4 + 12x^3 \\ \hline -6x^3 - 28x^2 + 28x - 6 \\ + 6x^3 + 30x^2 - 18x \\ \hline 2x^2 + 10x - 6 \\ - 2x^2 - 10x + 6 \\ \hline 0 \end{array}$$

Resultado = $4x^3 - 6x + 2$

5) $P(x) = x(x^3 + 2x^2 - 23x - 60) =$

a) $x(x-5)(x+3)(x+4)$

b) $Q(x) = x(x^4 - 16) = x(x^2 + 4)(x^2 - 4) = x(x^2 + 4)(x+2)(x-2)$

c) $R(x) = (x-1)(x-3)(3x-1)(3x+1)$

	1	2	-23	-60
5		5	35	60
	1	7	12	0

$\frac{-7 \pm \sqrt{49 - 48}}{2} = \frac{-7 \pm 1}{2}$

$\frac{-7+1}{2} = -3$

$\frac{-7-1}{2} = -4$

	9	-36	26	4	-3
1		9	-27	1	3
	9	-27	-1	3	0
3		27	0	-3	
	9	0	-1	0	

$9x^2 - 1 = (3x-1)(3x+1)$

6) a) $\frac{3x-1}{x} - \frac{x+3}{x(x-2)} + \frac{2x+5}{x-2} = \frac{(3x-1)(x-2) - (x+3) + (2x+5)x}{x(x-2)}$

$= \frac{3x^2 - 6x - x + 2 - x - 3 + 2x^2 + 5x}{x(x-2)} = \frac{5x^2 - 3x - 1}{x(x-2)}$

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



7. a)
$$\begin{array}{r|rrrr} 4 & -8 & x+3 & & \\ 1 & & 4 & -4 & -3 \\ \hline & & 4 & -4 & -3 \end{array} \rightarrow \boxed{x=1}$$

$$\frac{4 \pm \sqrt{16+48}}{8} = \frac{4 \pm 8}{8} \rightarrow \boxed{x = \frac{3}{2}}$$

$$\rightarrow \boxed{x = -\frac{1}{2}}$$

b) $\log(x+3) - \log(x+1) + \log 5 = 1$

$\log \frac{5(x+3)}{x+1} = 1 \rightarrow 5x+15 = 10x+10 \rightarrow -5x = -5 \rightarrow \boxed{x=1}$

c) $3^{x+1} + 9^{x-1} = 162$

$3^{x+1} + 3^{2x-2} = 162$

$C = 3^x$

$3^x = 27$

$\boxed{x=3}$

$3C + \frac{C^2}{9} = 162 \text{ mcm}=9$

$27C + C^2 = 1458$

$C^2 + 27C - 1458 = 0$

$C = \frac{-27 \pm \sqrt{27^2 + 4 \cdot 1458}}{2} = \frac{-27 \pm 81}{2}$

$C = 27$

$C = -54 \#$

d) $\frac{x}{x-1} + \frac{2x}{x+1} = 3 \text{ mcm} = (x-1)(x+1)$

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

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

$-x = -3 \rightarrow \boxed{x=3}$

e) $x - \sqrt{x-3} = 1 \rightarrow (\sqrt{x-3})^2 = (x-1)^2 \rightarrow 2x-3 = x^2 - 2x + 1 \rightarrow x^2 - 4x + 4 = 0$

$\boxed{x=2}$

f) $x^4 - 10x^2 + 9 = 0 \rightarrow x^2 = \frac{10 \pm \sqrt{100 - 36}}{2} = \frac{10 \pm 8}{2}$

$x^2 = 9 \rightarrow \boxed{x = \pm 3}$

$x^2 = 1 \rightarrow \boxed{x = \pm 1}$

g) $2^{x+1} = 2^{2x-2} \rightarrow x+1 = 2x-2 \rightarrow \boxed{x=3}$

8. a)
$$\begin{array}{r} 3x+2y=7 \\ 5x-y=16 \end{array} \cdot 2 \rightarrow \begin{array}{r} 3x+2y=7 \\ 10x-2y=32 \end{array}$$

$$\frac{13x}{13} = \frac{39}{13} \rightarrow x = \frac{39}{13} \rightarrow \boxed{x=3}$$

$15 - y = 16 \rightarrow \boxed{y=-1}$

b) $y - x = 1 \rightarrow y = 1 + x$

$x^2 + y^2 = 5 \rightarrow x^2 + (1+x)^2 = 5 \rightarrow x^2 + 1 + 2x + x^2 = 5$

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

$x^2 + x - 2 = 0$

$\boxed{x=-2} \rightarrow \boxed{y=-1}$



9) a) $\frac{x^3}{x^2-9} \geq 0$ $x^3=0 \rightarrow x=0$ $mcm = x^2-9=0 \rightarrow x=\pm 3$

$x \in (-3, 0] \cup (3, \infty)$

b) $x^3 - 4x < 0$ $x^2 - 4x = 0$ $x=0$
 $x(x^2-4)=0 \rightarrow x^2=4 \rightarrow x=\pm 2$

$x \in (-\infty, -2) \cup (0, 2)$

c) $x^2 - 3x + 2 \leq 4x - 8$ $x^2 - 7x + 10 = 0$
 $x = \frac{7 \pm \sqrt{49 - 40}}{2} = \frac{7 \pm 3}{2} \rightarrow x=5$
 $x=2$

$x \in [2, 5]$

10) a) $x+3 > 0$ $x > -3$
 $x^2 - 4x \leq 0$ $x=0, x=4$

$x \in [0, 4]$

b) $x^2 - 9 > 0$ $x = \pm 3$
 $x^3 - 4x \leq 0$ $x=0, x=\pm 2$

$x \in (-\infty, -3)$