



COLEGIO ALMA'S
bilingual school

APELLIDOS Y NOMBRE: Corrección Pauperación
CURSO: 1° Bachillerato N° 1ª Evaluación
FECHA: 10-01-2018 ASIGNATURA: Matemáticas

1) a) $\frac{-3\sqrt{2}}{\sqrt{5}-\sqrt{2}} \cdot \frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}+\sqrt{2}} = \frac{-3(\sqrt{2}^2 \cdot 5 + \sqrt{2}^2 \cdot 2)}{5-2} = \boxed{-\frac{15\sqrt{2}-6\sqrt{2}}{3}}$

b) $\frac{2}{5\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \boxed{\frac{2\sqrt{5}}{25}}$

2) a) $3x^3 + 12x^2 + 3x - 18 = 0$

1	3	12	3	-18
		3	15	18
	3	15	18	0

$X = \frac{-15 \pm \sqrt{15^2 - 4 \cdot 3 \cdot 18}}{6}$
 $X = \frac{-15 \pm 3}{6} \rightarrow \boxed{X = -2}$
 $\boxed{X = 1}$
 $\boxed{X = -3}$

b) $12x^2 - 73x + 6 = 0$

6	12	-73	5	6
		72	-6	-6
	12	-1	-1	0

$X = \frac{1 \pm \sqrt{1 + 4 \cdot 12 \cdot 1}}{24}$
 $X = \frac{1 \pm 7}{24} \rightarrow \boxed{X = \frac{1}{3}}$
 $\boxed{X = 6}$
 $\boxed{X = -\frac{1}{4}}$

c) $x^4 + 3x^2 - 4 = 0 \rightarrow x^2 = \frac{-3 \pm \sqrt{9 + 16}}{2} = \frac{-3 \pm 5}{2}$
 $x^2 = -4 \#$
 $x^2 = 1 \rightarrow \boxed{X = \pm 1}$

d) $\frac{3x-3}{x-1} + \frac{x^2+2}{x+1} = \frac{7x+1}{(x+1)(x-1)}$ mcm = x^2-1

$(3x-3)(x+1) + (x^2+2)(x-1) = 7x+1$
 $3x^2+3x-3x-3+x^3-x^2+2x-2=7x+1$
 $x^3+2x^2-5x-6=0$

1	1	2	-5	-6
		1	-1	6
	1	1	-6	0

$X = \frac{-1 \pm \sqrt{1 + 24}}{2} = \frac{-1 \pm 5}{2} \rightarrow \boxed{X = 2}$
 $\boxed{X = -3}$
No valida

e) $\sqrt{x+5} = 3x-3$

$(\sqrt{x+5})^2 = (3x-3)^2$
 $2x+5 = 9x^2 - 6x + 9$

$9x^2 - 20x + 4 = 0$
 $X = \frac{20 \pm \sqrt{400 - 4 \cdot 9 \cdot 4}}{18} = \frac{20 \pm 16}{18}$
 $\boxed{X = 2}$
 $X = \frac{2}{9} \#$

f) $2 \cdot 4^{x+1} + 2^{x+2} = \frac{3}{2}$ $f = 2^x$ mcm = 2

$16f^2 + 8f - 3 = 0$
 $f = \frac{-8 \pm \sqrt{64 + 4 \cdot 16 \cdot 3}}{32} = \frac{-8 \pm 16}{32}$
 $f = \frac{1}{4} = 2^x \rightarrow \boxed{X = -2}$



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a) $\log_{\frac{1}{2}}(x+1) - 2\log_{\frac{1}{2}} x = 1$ $\log_{\frac{1}{2}} \frac{x+1}{x^2} = 1$ $\frac{x+1}{x^2} = 2 \rightarrow 2x^2 - x - 1 = 0$

$x = \frac{1 \pm \sqrt{1+8}}{4} = \frac{1 \pm 3}{4}$ $\begin{cases} x=1 \\ x=-\frac{1}{2} \# \end{cases}$

b) $\begin{cases} x+y=4 \\ x^2+y^2=10 \end{cases} \rightarrow \begin{cases} y=4-x \\ x^2+(4-x)^2=10 \end{cases}$ $\begin{cases} 2x^2-8x+6=0 \\ x^2-4x+3=0 \end{cases}$

$x^2+16-8x+x^2=10$ $x = \frac{4 \pm \sqrt{16-12}}{2} = \frac{4 \pm 2}{2}$

$x=3 \rightarrow y=4-3 \rightarrow y=1$

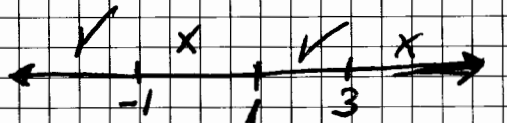
$x=1 \rightarrow y=4-1 \rightarrow y=3$

$2x-3-1=2 \rightarrow x=3$

c) $\left(\begin{array}{ccc|c} 2 & 3 & -1 & 2 \\ 1 & -1 & 1 & 5 \\ 1 & 1 & -3 & -1 \end{array} \right) \xrightarrow{2F_2-F_1} \left(\begin{array}{ccc|c} 2 & 3 & -1 & 2 \\ 0 & -5 & 3 & 8 \\ 0 & -1 & -5 & -4 \end{array} \right) \xrightarrow{5F_3-F_2} \left(\begin{array}{ccc|c} 2 & 3 & -1 & 2 \\ 0 & -5 & 3 & 8 \\ 0 & 0 & 1 & 1 \end{array} \right) \rightarrow \begin{cases} y=-1 \\ z=1 \end{cases}$

d) $x^3 - 3x^2 - x + 3 \leq 0$

$\begin{array}{r|rrrr} & 1 & -3 & -1 & 3 \\ 3 & & 3 & 0 & -3 \\ \hline & 1 & 0 & -1 & 0 \end{array} \rightarrow \begin{cases} x=3 \\ x=\pm 1 \end{cases}$



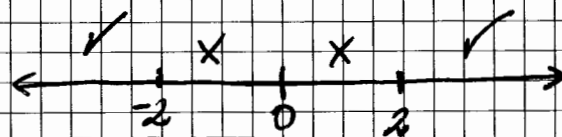
$x \in (-\infty, -1] \cup [1, 3]$

e) $x^2 - \frac{64}{x^2} > -12$ $mcm = x^2 = 0 \rightarrow x=0$

$x^4 - 64 > -12x^2$

$x^4 + 12x^2 - 64 = 0 \rightarrow x = \frac{-12 \pm \sqrt{144 + 4 \cdot 64}}{2} = \frac{-12 \pm 20}{2}$

$x^2 = 4 \rightarrow x = \pm 2$
 $x^2 = -16 \#$



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

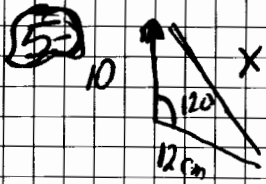


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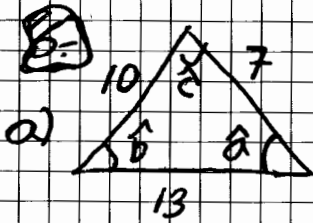
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$$X = \sqrt{10^2 + 12^2 - 2 \cdot 10 \cdot 12 \cdot \cos 120} = \boxed{19'078 \text{ cm}}$$



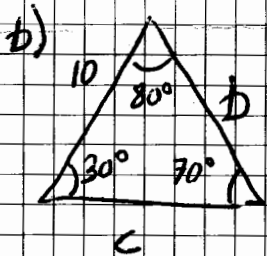
$$10^2 = 7^2 + 13^2 - 2 \cdot 7 \cdot 13 \cdot \cos \hat{\alpha}$$

$$\hat{\alpha} = \arccos \frac{10^2 - 7^2 - 13^2}{2 \cdot 7 \cdot 13} = \boxed{49'58^\circ}$$

$$7^2 = 10^2 + 13^2 - 2 \cdot 10 \cdot 13 \cdot \cos \hat{\beta}$$

$$\hat{\beta} = \arccos \frac{10^2 + 13^2 - 7^2}{2 \cdot 10 \cdot 13} = \boxed{32'20^\circ}$$

$$\hat{\gamma} = 180 - 49'58 - 32'20 = \boxed{98'22^\circ}$$



$$\frac{\sin 70}{10} = \frac{\sin 30}{b} \rightarrow b = \frac{10 \sin 30}{\sin 70} = \boxed{5'32 \text{ cm}}$$

$$\frac{\sin 70}{10} = \frac{\sin 80}{c} \rightarrow c = \frac{10 \sin 80}{\sin 70} = \boxed{10'48 \text{ cm}}$$

7. a) $\sin x + \cos x = 1$

$$\cos x = 1 - \sin x$$

$$\cos^2 x = 1 - 2 \sin x + \sin^2 x$$

$$1 - \sin^2 x = 1 - 2 \sin x + \sin^2 x$$

$$2 \sin^2 x - 2 \sin x = 0$$

$$2 \sin x (\sin x - 1) = 0$$

$$\sin x = 0 \rightarrow$$

$$\boxed{x = 0, \pi}$$

$$\sin x = 1 \rightarrow$$

$$\boxed{x = \frac{\pi}{2}}$$

no válida.

b) $\cos^2 x - 3 \cos x + 2 = 0$ $\frac{3 \pm \sqrt{9-8}}{2} = \frac{3 \pm 1}{2}$ $\left\{ \begin{array}{l} \cos x = 2 \# \\ \cos x = 1 \rightarrow \boxed{x = 0} \end{array} \right.$

c) $\lg x \cdot \sin x = \sqrt{2}$

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



$$\text{sen } X = \frac{-1 \pm \sqrt{1+8}}{2\sqrt{2}} = \frac{-1 \pm 3}{2\sqrt{2}} \begin{cases} \text{sen } X = \frac{-2}{\sqrt{2}} \# \\ \text{sen } X = \frac{\sqrt{2}}{2} \end{cases} \begin{cases} X = \frac{\pi}{4} \\ X = \frac{3\pi}{4} \end{cases}$$

8) $x - 2y - 3 = 0 \rightarrow \vec{O}(2,1) \quad m = 1/2$

a) $2x + y - 5 = 0 \rightarrow \vec{U}(1,-2) \rightarrow \vec{U} \cdot \vec{O} = 0 \rightarrow$ Perpendiculares 90°

b) $\vec{U}(2,1)$
 $P(1,3) \rightarrow d = \frac{|1-6-3|}{\sqrt{1+4}} = \frac{8}{\sqrt{5}} \neq 0 \rightarrow$ Paralelas

c) $\vec{U}(2,1)$
 $P(0,3) \rightarrow d = \frac{|0-6-3|}{\sqrt{1+4}} = \frac{9}{\sqrt{5}} \neq 0 \rightarrow$ Paralelas

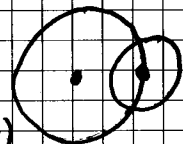
9) $x^2 + y^2 - 12x - 16y = 0 \rightarrow C(6,8) \rightarrow r = 10$

a) $P(6,8) \rightarrow$ El pto es interior ya que es el mismo centro de la circunferencia

b) $d = \frac{|16-8+3|}{\sqrt{2}} = \frac{1}{\sqrt{2}} < 10 \rightarrow$ Es secante a la circunferencia

c) $x^2 + y^2 = 10 \rightarrow$ Centro $(0,0) \rightarrow r = \sqrt{10}$

Distancia entre centros $d = 10 \rightarrow$ eso implica que una circunferencia pasa por el centro de otra = SECANTES



10) Centro $(-1,0)$ Vertical \rightarrow Focos $(-1,-4), (-1,4)$

Cuerda = $2 \cdot 5 = 10$

distancia focal $25 = 9 + c^2 \rightarrow c = 4$

11) $c = 3$ Horizontal $\left\{ \begin{array}{l} 5^2 = 3^2 + b^2 \rightarrow b = 4 \\ a = 5 \end{array} \right.$

$$\frac{(x-2)^2}{25} + \frac{(y-2)^2}{16} = 1$$