SECOND TERM GLOBAL TEST

4º ESO

Exercise 1: (1 pto) Work out using the properties of logarithms and indicating all of the steps

$$\log_3 \frac{\sqrt{3}\cdot\sqrt[3]{9}}{\sqrt[4]{27}} = \frac{5}{12}$$

Exercise 2: (1.25 ptos) Work out:

a) $\lim_{x\to 1} \frac{x^2+4x-5}{x^2-1} = 3$ (0.5)

b) $\lim_{x\to\infty} \left(3x - \frac{3x^2-4x+7}{x-1}\right) = 1$ (0.75)

Exercise 3: (0.75 ptos) Find the asymptotes of the function $f(x) = \frac{5x^2-4x+3}{x^2-1}$ $\rightarrow$ $\begin{cases} HA] & y=5 \\ VA] & x=\pm 1 \end{cases}$

Exercise 4: (2 ptos) Find the domain of the following functions:

a) $f(x) = \frac{x^2-4}{\sqrt{x^2-5x+4}}$ $\rightarrow$ $\text{Dom } f = (-\infty,1)\cup(4,+\infty)$ (0.75)

b) $f(x) = \frac{\sqrt{x+5}}{x^2-4}$ $\rightarrow$ $\text{Dom } f = [-5,-2)\cup(-2,2)\cup(2,+\infty)$ (0.75)

c) $f(x) = \frac{2x-1}{2x-5}$ $\rightarrow$ $\text{Dom } f = \mathbb{R} - \left\{\frac{5}{2}\right\}$ (0.5)

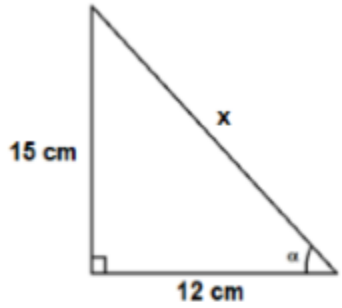
Exercise 5: (1 pto) Find the **general** equation of the line going through the points $A(2,-3)$ and $B(5,1)$

$4x-3y-17=0$

Exercise 6: (1 pto) If $\cos\alpha = 0.72$ find the values of $\sin\alpha$, $\tan\alpha$ and the angle α using degrees, minutes and seconds. Round the answers to four decimal figures if needed

$\sin\alpha = 0.694$ $\tan\alpha = 0.9639$ $\alpha = 43^\circ 56' 44''$

Exercise 7: (1.25 ptos) Find the three principal trigonometric functions of the angle α with four decimal figures, and the value of the missing side. You can't use Pythagoras' theorem.



$$\tan\alpha = 1.25$$
$$\cos\alpha = 0.6247$$
$$\sin\alpha = 0.7809$$
$$x = 19.21 \text{ cm}$$

Exercise 8: (1.75 ptos) Sketch the graph of the piecewise function:

$$f(x) = \begin{cases} 3 & x < -1 \\ 2^x & -1 \le x < 3 \\ x^2 - 12x + 35 & 3 \le x < 8 \end{cases}$$