



**SECOND TERM GLOBAL TEST**  
**4° ESO**



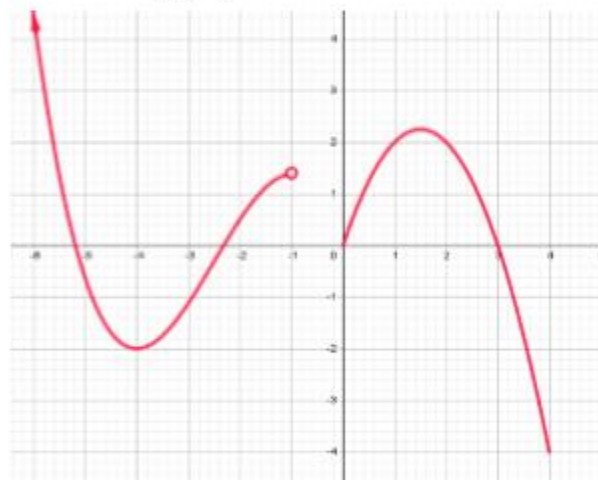
**Exercise 1: (1.75 ptos)**

- a) Study the asymptotes of the function  $f(x) = \frac{5x+3}{x^2-5x+6} \begin{cases} \underline{HA} & y=0 \\ \underline{VA} & x=2, \quad x=3 \end{cases}$
- b) Work out:  $\log_2 \frac{\sqrt[3]{64} \sqrt{2}}{\sqrt[3]{8}} = \frac{53}{70}$
- c) Find the domain of the function  $f(x) = \frac{x-7}{\sqrt{1-x^2}} \rightarrow \text{Dom } f = (-1,1)$

**Exercise 2: (1 pto) Work out:**

- a)  $\lim_{x \rightarrow 1} \frac{x^2 - 2x + 1}{x^2 - 1} = 0$
- b)  $\lim_{x \rightarrow \infty} \left( \frac{5x^2 - 3x}{x + 2} - 5x \right) = -13$

**Exercise 3: (1.5 ptos) Given the following graph of a certain function:**



- a) Indicate the domain and the image  $\text{Dom } f = (-\infty, -1) \cup [0, 4] \quad \text{Im } f = [-4, +\infty)$
- b) Study the monotony **Increases:**  $(-4, -1) \cup (0, 1.5)$  **Decreases:**  $(-\infty, -4) \cup (1.5, 4)$
- c) Indicate the relative and absolute extrema  
**Relative maxima:**  $x = 1.5$  **Absolute maximum:**  $\cancel{\exists}$   
**Relative minima:**  $x = -4, \quad x = 0, \quad x = 4$  **Absolute minimum:**  $x = 4$



**Exercise 4: (1.5 pts)** Sketch the graph of the piecewise function

$$f(x) = \begin{cases} x^2 + 2x + 1 & x \leq 1 \\ \log_2 x & 1 < x < 8 \\ 3 & x \geq 8 \end{cases}$$



**Exercise 5: (1.25 pts)** If  $\tan \alpha = 0.37$  and  $\pi < \alpha < \frac{3\pi}{2}$  find the other five trigonometric functions and the value of the angle  $\alpha$

$$\cos \alpha = -0.94$$

$$\sin \alpha = -0.35$$

$$\alpha = 200.3^\circ$$

$$\sec \alpha = -1.06$$

$$\csc \alpha = -2.86$$

$$\cot \alpha = 2.7$$

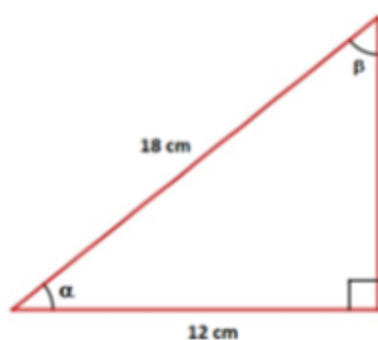
**Exercise 6: (1 pto)** Find the three principal trigonometric functions (sine, cosine and tangent) of the angle  $\frac{5\pi}{4}$ , without using a calculator.

$$\cos \frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$\sin \frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$\tan \frac{5\pi}{4} = 1$$

**Exercise 7: (0.75 pts)** Find the missing side of this right-angled triangle without using Pythagoras' theorem. Find also the value of the angles  $\alpha$  and  $\beta$



$$x = 13.42 \text{ cm}$$

$$\alpha = 48.19^\circ$$

$$\beta = 41.81^\circ$$



**Exercise 8: (1.25 pto)** Find the height of the Big Ben if Daniel and Lois are standing 150 m apart,  $\alpha = 57.99^\circ$  and  $\beta = 46.85^\circ$   $h = 96$  m

