

Very short answer questions

1. 2 marks Each part is worth 1 marks. Please write your answers in the boxes.

Consider the function, $h(x) = 2x^3 - 9x^2 + 12x$.

- (a) What are the coordinates of the local maximum of $h(x)$?

Answer:

- (b) What are the coordinates of the local minimum of $h(x)$?

Answer:

Short answer questions — you must show your work

2. 8 marks Each part is worth 2 marks.

- (a) Find the intervals where $f(x) = \frac{x^2}{x-3}$ is decreasing.

- (b) Let $f(x) = \cos(x^3 + x^2 - 2) \sin(2x)$. Show that there exists a real number c such that $f'(c) = 0$.

(c) Evaluate $\lim_{x \rightarrow \infty} \frac{\arctan x - \frac{\pi}{2}}{1/x}$.

(d) Evaluate $\lim_{x \rightarrow 0^+} \log(x) \tan(x)$.