

First Name: _____ Last Name: _____

Student-No: _____ Section: _____

Very short answer questions

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

Consider the function, $h(x) = 2x^3 - 6x^2 + 2$.

- (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. 4 marks Each part is worth 2 marks.

- (a) Find the intervals where $f(x) = \arcsin(x) + 2\sqrt{1-x^2}$ is increasing.

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

Long answer question — you must show your work

3. 4 marks Find the global maximum and the global minimum for $f(x) = 3x^4 - 4x^3 + 3$ on the interval $[-1, 2]$.

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Very short answer questions

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

Consider the function, $h(x) = x^3 - 3x + 5$.

- (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. 4 marks Each part is worth 2 marks.

- (a) Find the intervals where $f(x) = \frac{\sqrt{x}}{x+6}$ is increasing.

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

Long answer question — you must show your work

3. 4 marks Find the global maximum and the global minimum for $f(x) = x^3 - 6x^2 + 2$ on the interval $[3, 5]$.

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Very short answer questions

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

Consider the function, $h(x) = x^3 - 12x + 4$.

- (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. 4 marks Each part is worth 2 marks.

- (a) Find the intervals where $f(x) = \frac{\sqrt{x-1}}{2x+4}$ is increasing.

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

Long answer question — you must show your work

3. 4 marks Find the global maximum and the global minimum for $f(x) = x^5 - 5x - 10$ on the interval $[0, 2]$.

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Very short answer questions

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

Consider the function, $h(x) = 2x^3 - 6x + 2$.

- (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. 4 marks Each part is worth 2 marks.

- (a) Find the intervals where $f(x) = xe^{-x^2/2}$ is increasing.

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

Long answer question — you must show your work

3. 4 marks Find the global maximum and the global minimum for $f(x) = 4x^3 - 6x^2 + 3$ on the interval $[-1, 2]$.