

First Name: _____ Last Name: _____

Student-No: _____ Section: _____

Very short answer questions

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

(a) Differentiate $e^{\cos(\log x)}$. Recall that $\log x = \log_e x = \ln x$.

Answer:

(b) If $x^2 + y^2 = \sin(x + y)$ compute $\frac{dy}{dx}$.

Answer:

Short answer questions — you must show your work

2. 4 marks Each part is worth 2 marks.

(a) Differentiate $f(x) = (x^2 + 1)^{\sin(x)}$.

(b) Consider a function of the form $f(x) = Ae^{kx}$ where A and k are constants. If $f(0) = 3$ and $f(2) = 5$, find the constants A and k .

Long answer question — you must show your work

3. 4 marks If $x^2 \cos(y) + 2xe^y = 8$, then find y' at the points where $y = 0$. You must justify your answer.

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Very short answer questions

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

(a) Differentiate $e^{\sin^2(x)}$

Answer:

(b) If $x^3 + y^4 = \cos(x^2 + y)$ compute $\frac{dy}{dx}$.

Answer:

Short answer questions — you must show your work

2. 4 marks Each part is worth 2 marks.

(a) Differentiate $f(x) = x^{\cos^3(x)}$.

(b) Consider a function of the form $f(x) = Ae^{kx}$ where A and k are constants. If $f(0) = 2$ and $f(5) = 3$, find the constants A and k .

Long answer question — you must show your work

3. 4 marks If $x^2e^y + 4x \cos(y) = 5$, then find y' at the points where $y = 0$. You must justify your answer.

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Very short answer questions

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

(a) Differentiate $\sin(e^{5x})$

Answer:

(b) If $e^y = xy^2 + x$, compute $\frac{dy}{dx}$.

Answer:

Short answer questions — you must show your work

2. 4 marks Each part is worth 2 marks.

(a) Differentiate $f(x) = (x^2 + 1)^{(x^2+1)}$.

(b) Consider a function of the form $f(x) = Ae^{kx}$ where A and k are constants. If $f(0) = 2$ and $f(3) = 1$, find the constants A and k .

Long answer question — you must show your work

3. 4 marks If $x^2 + (y + 1)e^y = 5$, then find y' at the points where $y = 0$. You must justify your answer.

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Very short answer questions

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

(a) Differentiate $\sin(e^{\sin x})$.

Answer:

(b) If $\cos(x^2 + y^2) = x + y$ compute $\frac{dy}{dx}$.

Answer:

Short answer questions — you must show your work

2. 4 marks Each part is worth 2 marks.

(a) Differentiate $f(x) = (\sin x)^{\tan x}$.

(b) Consider a function of the form $f(x) = Ae^{kx}$ where A and k are constants. If $f(0) = -2$ and $f(7) = -3$, find the constants A and k .

Long answer question — you must show your work

3. 4 marks If $x^2 + y^2 = x \cos(y) + y \cos(x)$, then find y' at the points where $y = 0$. You must justify your answer.