

1. (1 pt) Let

$$f(x) = 3e^{x \sin x}$$

$$f'(x) = \underline{\hspace{2cm}}$$

2. (1 pt) Find the derivative of the function

$$g(x) = (4x^2 - 5x + 3)e^x$$

$$g'(x) = \underline{\hspace{2cm}}$$

3. (1 pt) Let $f(x) = 10x + 6 - 9e^x$. Then the equation of the tangent line to the graph of $f(x)$ at the point $(0, -3)$ is given by $y = mx + b$ for

$$m = \underline{\hspace{1cm}}$$

and

$$b = \underline{\hspace{1cm}}.$$

4. (1 pt) Consider the function

$$f(x) = \frac{e^x}{8 + e^x}$$

$$\text{Then } f'(x) = \underline{\hspace{2cm}}$$

The following questions ask for endpoints of intervals of increase or decrease for the function $f(x)$.

Write INF for ∞ , MINF for $-\infty$, and NA (ie. not applicable) if there are no intervals of that type.

The interval of increase for $f(x)$ is from _____
to _____

The interval of decrease for $f(x)$ is from _____
to _____

$f(x)$ has a local minimum at _____. (Put NA if none.)

$f(x)$ has a local maximum at _____. (Put NA if none.)

Then $f''(x) = \underline{\hspace{2cm}}$

The following questions ask for endpoints of intervals of upward and downward concavity for the function $f(x)$.

Write INF for ∞ , MINF for $-\infty$, and put NA if there are no intervals of that type.

The interval of upward concavity for $f(x)$ is from _____
to _____

The interval of downward concavity for $f(x)$ is from _____
to _____

$f(x)$ has a point of inflection at _____. (Put NA if none.)

5. (1 pt) The function $f(x) = (5x + 8)e^{2x}$ has one critical number. Find it.

6. (1 pt) Let

$$f(x) = -8e^{-x/4}$$

$$f^{(7)}(1) = \underline{\hspace{2cm}}$$

$$7. (1 \text{ pt}) \int \sqrt[4]{e^x} dx = \underline{\hspace{2cm}} + C$$

8. (1 pt) Evaluate the indefinite integral.

$$\int x^2 e^{x^3} dx$$
