

1. (1 point) Find the equation of the tangent line to the curve $f(x) = \sin x + 5x \cos x$ at the point $(\pi, -5\pi)$. The equation of this tangent line can be written in the form $y = mx + c$. Compute m and c .

$m =$ _____

$c =$ _____

Answer(s) submitted:

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•

(incorrect)

2. (1 point) Let $x^3 + y^3 = 65$. Find $y''(x)$ at the point $(4, 1)$.

$y''(4) =$ _____

Answer(s) submitted:

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(incorrect)

3. (1 point) Find the 107th derivative of the function $f(x) = \cos(x)$.

Answer: _____

Answer(s) submitted:

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(incorrect)

4. (1 point) Suppose that the equation of motion for a particle (where s is in meters and t in seconds) is

$$s = (1/3)t^3 - 8t^2 + 64t + 8$$

(a) Find the velocity and acceleration as functions of t .

Velocity at time $t =$ _____

Acceleration at time $t =$ _____

(b) Find the acceleration after 1 second.

Acceleration after 1 second: _____

(c) Find the acceleration at the instant when the velocity is 0.

Acceleration: _____

Answer(s) submitted:

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(incorrect)

5. (1 point) Let $f(x) = \frac{(2x-8)^3}{(3x+7)^4}$. Find $f'(x)$.

$f'(x) =$ _____

Answer(s) submitted:

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(incorrect)

6. (1 point) Find $\frac{dy}{dx}$ by implicit differentiation.

$$6 + 4x = \sin(xy^2)$$

Answer: $\frac{dy}{dx} =$ _____

Answer(s) submitted:

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(incorrect)

7. (1 point) Use linear approximation to approximate $\sqrt{64.2}$ as follows.

Let $f(x) = \sqrt{x}$. The equation of the tangent line to $f(x)$ at $x = 64$ can be written in the form $y = mx + c$. Compute m and c .

$m =$ _____

$c =$ _____

Using this find the approximation for $\sqrt{64.2}$.

Answer: _____

Answer(s) submitted:

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(incorrect)

8. (1 point) Consider the function $f(x) = 2x^3 + 21x^2 - 180x + 11$, $-10 \leq x \leq 4$.

Find the absolute minimum value of this function.

Answer: _____

Find the absolute maximum value of this function.

Answer: _____

Answer(s) submitted:

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(incorrect)

9. (1 point) Determine where the absolute extrema of $f(x) = \frac{4x}{x^2+1}$ on the interval $[-4, 0]$ occur:

1. The absolute maximum occurs at $x =$ _____
2. The absolute minimum occurs at $x =$ _____

Answer(s) submitted:

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(incorrect)

10. (1 point) Find two numbers differing by 40 whose product is as small as possible.

Enter your two numbers as a comma separated list, e.g. 2, 3.
The two numbers are _____

Answer(s) submitted:

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(incorrect)