1. (1 point) Consider the function $f(x) = 3x^3 - 4x$ on the interval $[-5,5]$. Find the average or mean slope of the function on this interval. ________
By the Mean Value Theorem, we know there exists at least one c in the open interval $(-5,5)$ such that $f'(c)$ is equal to this mean slope.
For this problem, there are two values of c that work. The smaller one is ________ and the larger one is ________

Correct Answers:

- `71`
- `-2.88675134594813`
- `2.88675134594813`

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2. (1 point) Consider the function $f(x) = \frac{1}{x}$ on the interval $[1,10]$.
(A) Find the average or mean slope of the function on this interval.
Average Slope = ________
(B) By the Mean Value Theorem, we know there exists a c in the open interval $(1,10)$ such that $f'(c)$ is equal to this mean slope. Find all values of c that work and list them (separated by commas) in the box below.
List of values: ________

Correct Answers:

- `-0.1`
- `3.16227766016838`

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3. (1 point) Consider the function $f(x) = 10\sqrt{x} + 6$ on the interval $[2,10]$.

(A) Find the average or mean slope of the function on this interval.
Average Slope = ________
(B) By the Mean Value Theorem, we know there exists at least one c in the open interval $(2,10)$ such that $f'(c)$ is equal to this mean slope. Find all values of c that work and list them (separated by commas) in the box below.
List of values: ________

Correct Answers:

- `2.18508012224411`
- `5.23606797749979`

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4. (1 point) Consider the function $f(x) = 1 - 4x^2$ on the interval $[-4,8]$.
(A) Find the average or mean slope of the function on this interval, i.e.

$$\frac{f(8) - f(-4)}{8 - (-4)} = \underline{\qquad\qquad}$$

(B) By the Mean Value Theorem, we know there exists a c in the open interval $(-4,8)$ such that $f'(c)$ is equal to this mean slope. For this problem, there is only one c that works. Find it.
c = ________

Correct Answers:

- `-16`
- `2`

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5. (1 point)
Find the limit. Use l'Hospital's Rule if appropriate. Use INF to represent positive infinity, NINF for negative infinity, and D for the limit does not exist.

$$\lim_{x\to(\pi/2)^+} \frac{5\cos x}{1-\sin x} = \underline{\qquad}$$

Correct Answers:

- `NINF`

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6. (1 point)
Find the limit. Use l'Hospital's Rule if appropriate. Use INF to represent positive infinity, NINF for negative infinity, and D for the limit does not exist.

$$\lim_{x\to 0} \frac{7x + 7\sin x}{6x + 6\cos x} = \underline{\qquad}$$

Correct Answers:

- `0`

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7. (1 point)
Find the limit. Use l'Hospital's Rule if appropriate. Use INF to represent positive infinity, NINF for negative infinity, and D for the limit does not exist.

$$\lim_{x\to-\infty} 2x^2 e^x = \underline{\qquad}$$

Correct Answers:

- `0`

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8. (1 point) Evaluate the following limit. Enter **-I** if your answer is $-\infty$, enter **I** if your answer is ∞, and enter **DNE** if the limit does not exist.

$$\lim_{x\to 0}\left(\frac{1}{2x} - \frac{1}{e^{2x}-1}\right) = \underline{\qquad}$$

Correct Answers:

- `0.5`

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9. (1 point) Compute the following limits using l'Hôpital's rule if appropriate. Use INF to denote ∞ and MINF to denote $-\infty$.

$$\lim_{x\to 0} \frac{1-\cos(8x)}{1-\cos(5x)} = \underline{\qquad}$$

$$\lim_{x\to 1} \frac{6^x - 5^x - 1}{x^2 - 1} = \underline{\qquad}$$

Correct Answers:

- `2.56`

- 1.35168362659891

10. (1 point) Find the following limits, using l'Hôpital's rule if appropriate

$\lim_{x\to\infty} \dfrac{\arctan(x^5)}{x^4} =$ __________

$\lim_{x\to 0^+} \sqrt[4]{x}\ln(x) =$ __________

Correct Answers:

- 0
- 0