

MTH 1125 (12 pm) Test #3

FALL 2023

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Name _____

Instructions. Show CLEARLY how you arrive at your answers.

1. $f(x) = 2x^3 - 3x^2 + 2$ Determine the intervals on which $f(x)$ is increasing/decreasing and identify all relative maximums and minimums. (Caution - there are **two** critical numbers. Make sure you get them both!)

2. $f(x) = x^4 - 8x^3 - 30x^2 + 6x + 3$ Determine the intervals on which $f(x)$ is Concave up/Concave down and identify all points of inflection. Determine the intervals on which $f(x)$ is Concave up/Concave down and identify all points of inflection.

3. $f(x) = x^3 + 6x^2 - 15x + 3$ on the interval $[-2, 2]$. Find the Absolute Maximum and Absolute Minimum values (if they exist).

4. $f(x) = \frac{1}{7}x^{\frac{14}{5}} - 2x^{\frac{4}{5}} + 1$ Determine the intervals on which $f(x)$ is increasing/decreasing and identify all relative maximums and minimums.

5. A rancher has 200 yards of fencing to enclose three adjacent rectangular corrals, as shown below. What overall dimensions should be used so that the enclosed area will be as large as possible?

