MTH 1125 (2 pm) Test #3

FALL 2023

Pat Rossi Name _____

Instructions. Show CLEARLY how you arrive at your answers.

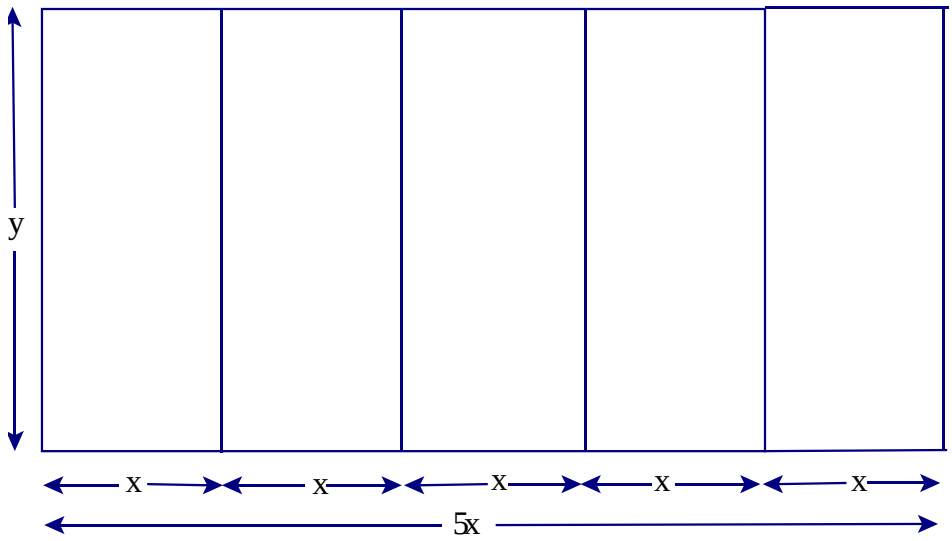
1. $f(x) = x^3 - 3x^2 + 2$ Determine the intervals on which $f(x)$ is increasing/decreasing and identify all relative maximums and minimums. (Caution - there are **two** critical numbers. Make sure you get them both!)

2. $f(x) = \frac{1}{4}x^4 + 2x^3 - \frac{15}{2}x^2 + 6x + 3$ 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. (Caution - there are **two** points of inflection. Make sure you get them both!)

3. $f(x) = 2x^3 + 15x^2 - 84x + 3$ on the interval $[-2, 3]$. Find the Absolute Maximum and Absolute Minimum values (if they exist).

4. $f(x) = \frac{3}{10}x^{\frac{20}{7}} - x^{\frac{6}{7}} - 2$ Determine the intervals on which $f(x)$ is increasing/decreasing and identify all relative maximums and minimums.

5. A rancher has 300 yards of fencing to enclose five adjacent rectangular corrals, as shown below. What overall dimensions should be used so that the enclosed area will be as large as possible?



EXTRA! (Wow! 10 points!)

In the exercise below,
[1]Deterimine the intervals on which $f(x)$ is increasing/decreasing
[2]Identify all relative maximums and minimums
[3]Deterimine the intervals on which $f(x)$ is CCU/CCD
[4]Identify all points of inflections
[5]Graph $f(x)$

$f(x) = x^3 - 3x^2 - 9x + 13$