Math1210 Quiz 11 (3.5, 3.6, 3.8) Summer, 2009 Dylan Zwick

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Instructions: Please show all of your work as partial credit will be given where appropriate, **and** there may be no credit given for problems where there is no work shown. All answers should be completely simplified, unless otherwise stated.

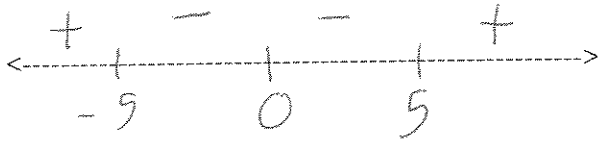
1. (8 points) For $f(x)=\frac{2(x-5)^2}{x}$

(with derivatives given by $f'(x)=\frac{2x^2-50}{x^2}$, $f''(x)=\frac{100}{x^3}$)

(a) Find the x-value of the vertical asymptote. (1 point)

V.A. : $x=0$

(b) Fill in the sign line for $f'(x)$. (2 points)

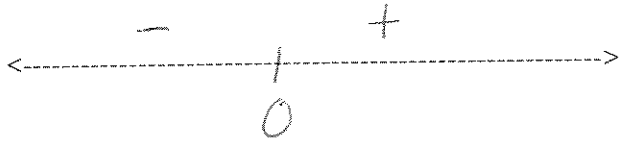


(c) Find all local min and max points, if there are any. (2 points)

Max points: $(-5,-40)$

Min points: $(5,0)$

(d) Fill in the sign line for $f''(x)$. (2 points)



(e) Find all inflection points, if there are any. (1 point)

Inflection points: None

Note: $x=0$ is not an inflection point, as $f(0)$ is not defined

2. (4 points) For $f(x)=2x^2-5x+1$ on [0, 3], decide whether or not the Mean Value Theorem (for derivatives) applies. If it does, find all acceptable values of c. If not, then state the reason.

$f(x)$ is continuous on $[0,3]$

$f'(x)=4x-5$ is well defined on $(0,3)$.

So, the MVT applies.

$\frac{f(3)-f(0)}{3-0}=\frac{4-1}{3}=1$, $f'(x)=1 \Rightarrow 4x-5=1$

$\Rightarrow x=\frac{6}{4}=\frac{3}{2}$

MVT applies: (True) or False (circle one)

If true, then c = $3/2$

If false, then why? NA

3. (3 points) Evaluate.

$$\int (3x^4-\sin x+\sqrt[5]{x^3})\,dx$$

$$\int (3x^4-\sin x+\sqrt[5]{x^3})\,dx$$

$$=\int (3x^4-\sin x+x^{3/5})\,dx$$

$$=\frac{3}{5}x^5+\cos x+\frac{x^{8/5}}{\frac{8}{5}}+C$$

$$=\frac{3}{5}x^5+\cos x+\frac{5x^{8/5}}{8}+C$$

Answer 3: $\boxed{\frac{3}{5}x^5+\cos x+\frac{5}{8}x^{8/5}}$