Calculus 2 Chapter 3 Retake Name_____

Show all work. All graphs must be on graph paper.

1. Find for $y = x^4 - 4x^3 + 16x$

$y' = 4(x+1)(x-2)^2$; $y'' = 12x(x-2)$

a) Domain _____

b) Range _____

c) Asymptotes _____

d) Relative extrema _____

e) Increasing/decreasing _____

f) Inflection points _____

g) Concavity _____

h) Then graph

2. Find for $y = 3x^{2/3} - x$

$y' = \frac{2 - x^{1/3}}{x^{1/3}}$; $y'' = \frac{-2}{3x^{4/3}}$

a) Domain _____

b) Range _____

c) Asymptotes _____

d) Relative extrema _____

e) Increasing/decreasing _____

f) Inflection points _____

g) Concavity _____

h) Then graph

Note: For questions 1-3, test also asks to name intercepts (as an ordered pair), symmetry (x/y/origin), and critical numbers.

Show all work. All graphs must be on graph paper.

3. Find for $f(x)=\dfrac{4x}{x^2+1}$

$f'(x)=\dfrac{-4(x^2-1)}{(x^2+1)^2}$; $f''(x)=\dfrac{8x(x^2-3)}{(x^2+1)^3}$

a) Domain _____

b) Range _____

c) Asymptotes _____

d) Relative extrema _____

e) Increasing/decreasing _____

f) Inflection points _____

g) Concavity _____

h) Then graph

Calculus 2 Chapter 3b Test Name_____

1. Locate the absolute extrema of the function $f(x)=3x^4 - 4x^3$ on the closed interval [-1,2]. 1_____

2. State why the Mean Value Theorem does or does not apply to the function $f(x)=\frac{2}{(x+1)^2}$ on the interval [- 3 , 0].

3. Find all relative extrema for $f(x)=\frac{x^3}{6}-8x$ 3_____

4. Find all relative extrema for $f(x)=\sin^2 x+\sin x$, for $(0,2\pi)$ 4_____

Find the limits:

5. $\lim_{x\to\infty}\frac{x^2-x^3+4}{3x^2+4x-1}$ 5_____

6. $\lim_{x\to-\infty}\frac{x}{\sqrt{4x^2-1}}$ 6_____

7. $\lim_{x\to\infty}(x-\sqrt{x^2+9x})$ 7_____