Quiz #10 Math 101 171

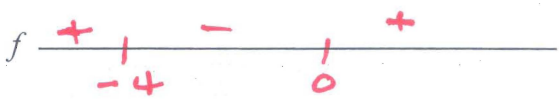
Name:	I.D.		

Q Consider the function $f(x) = x^{\frac{1}{3}}(x+4)$ Follow the steps to sketch the Graph of the function.

1) Find y-int. then x-int. then check if the graph above the x-axis or below.

1

$(0,0)$ $(-4,0)$



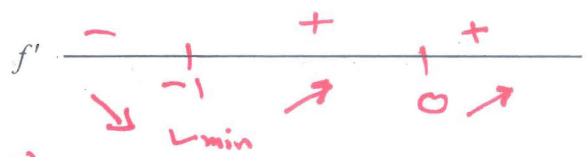
2) Find critical points then check if the graph increasing or decreasing , then find relative(local) extreme

2

$f'(x) = \frac{1}{3}x^{-2/3}(x+4) + x^{1/3}$

$= \frac{1}{3}x^{-2/3}\left[\frac{x+4+x}{3}\right]$

$= x^{-2/3}\left(\frac{4}{3}x + \frac{4}{3}\right)$ $= \frac{4(x+1)}{3\sqrt[3]{x^2}}$



c.p 0, −1

1 (3) Check the behavior of the graph as $x \to \infty$ and $x \to -\infty$

(4) Find asymptotes if any

$\lim_{x\to\infty} f(x) = \infty$ $\lim_{x\to-\infty} f(x) = \infty$

No Asymptotes

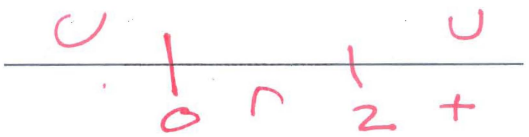
5) Check if the graph concave up or down then find inflection points if any

2

$f'' = \frac{4}{3}\left(-\frac{2}{3}\right)x^{-5/3}(x+1) + \frac{4}{3}x^{-2/3}$

$= -\frac{4}{3}x^{-5/3}\left[-\frac{2}{3}(x+1) + x\right] = \frac{4}{3}x^{-5/3}\left(\frac{1}{3}x - \frac{2}{3}\right)$

$= 4/9\, x^{-5/3}(x-2)$



2 6) Is there a vertical tangent

$\lim_{x\to0^+} f'(x) = \infty = \lim_{x\to0^-} f'(x)$

V.T at $x=0$

2 7) Sketch the graph