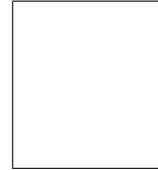




Quiz # 6
Math 101-Section 06 Calculus I
15 March, 2018, Thursday
Instructor: Ali Sinan Sertöz
Solution Key



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Name:

Department:

Student ID:

Q-1) Let $f(x) = \frac{3x^2 + 7x + 5}{x + 1}$.

(i) Calculate, and simplify $f'(x)$.

(ii) Calculate, and simplify $f''(x)$.

(iii) Plot the graph of $y = f(x)$ indicating all significant data on the graph, such as roots, local min/max, concavity, inflection points, asymptotes.

Answer:

$f(x) = \frac{3x^2 + 7x + 5}{x + 1} = (3x + 4) + \frac{1}{x + 1}$ has no root since the discriminant of the numerator is negative.

$f'(x) = \frac{3x^2 + 6x + 2}{(x + 1)^2} = 0$ when $x = -1 \pm \frac{1}{\sqrt{3}}$. Clearly one root is slightly less than -1 and the other is slightly larger than -1 . (-0.42 and -1.57)

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

Note that we have a vertical asymptote $x = -1$ and a slant asymptote $y = 3x + 4$.

Here is the graph:

