Short answer questions — you must show your work

1. **2 marks** An investment of $500 gained $100 in the last two months, what is the nominal interest rate, assuming it is compounded monthly?

   Answer:

2. **2 marks** Compute the limit \( \lim_{x \to 1} \frac{1}{x-1} + \frac{2}{x-1} \).

   Answer:

3. **2 marks** Evaluate

   \[
   \lim_{x \to 2} \frac{3x^2 - 5x - 2}{x^2 - 5x + 6}
   \]

   Answer:
4. **4 marks** Little Jonny is selling lemonade on Wesbrook Mall in summer. He is selling a cup for $1 and sells 100 cups a week. One week he tried to raise the price by 10 cents and he sold 20 cups less that week.

(a) Find the demand function linking \( p \) and \( q \).  

\[
\text{Answer:} \\
\]

(b) What is the price Jimmy needs to set for a cup of lemonade in order to maximize his revenue?  

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\text{Answer:} \\
\]