Q1: The graph of \( y = f(x) \) is a global graph (i.e. all interesting behavior and the end behavior is shown).

1. The two grey lines are not part of the graph, but they are asymptotes for the graph. What are their equations?
   
   vertical \( x = 1 \)  
   horizontal \( y = 2 \)

2. Evaluate the limits.
   Where applicable, use \(-\infty\) or \(+\infty\) instead of "dne"

   \[
   \lim_{x \to -\infty} f(x) = 2 \\
   \lim_{x \to 1^+} f(x) = +\infty
   \]

3. On what intervals is \( y = f(x) \) continuous? \((-\infty, 1) \cup (1, +\infty)\) 
   
   \( x < 1 \) or \( x > 1 \) 
   
   All real numbers except 1

Q2: Evaluate the limits using \(-\infty\) or \(+\infty\) instead of “does not exist” where appropriate.

A. \( \lim_{x \to -\infty} \frac{-5}{x} = 0 \)  
B. \( \lim_{x \to +\infty} 3x^2 - 4x^3 = -\infty \)  
C. \( \lim_{x \to +\infty} \frac{-3x^4 + 2x}{x^4 - 8} = -3 \)

Q3: Answer these questions about \( f(x) = \frac{5x + 3}{x - 2} \)

A. What is the domain of \( f(x) \)? Use interval notation.
   
   Domain is \((-\infty, 2) \cup (2, +\infty)\)

B. At what \( x - \text{value(s)} \) is \( f(x) = 0 \)? \( 5x + 3 = 0 \) \( \Rightarrow \) \( x = -\frac{3}{5} \)

C. On what interval(s) is \( f(x) > 0 \)? Show your work.
   
   Answer: \((-\infty, -\frac{3}{5}) \cup (2, +\infty)\)
Q1: The graph of \( y = f(x) \) is a global graph (i.e. all interesting behavior and the end behavior is shown).

1. The two grey lines are not part of the graph, but they are asymptotes for the graph. What are their equations?
   - vertical \( x = 1 \)
   - horizontal \( y = 2 \)

2. Evaluate the limits.
   Where applicable, use \( -\infty \) or \( +\infty \) instead of "dne"
   \[
   \lim_{x \to +\infty} f(x) = 2 \quad \lim_{x \to 1^-} f(x) = -\infty
   \]

3. On what intervals is \( y = f(x) \) continuous? \((-\infty, 1) \cup (1, +\infty)\)

Q2: Evaluate the limits using \(-\infty \) or \(+\infty \) instead of "does not exist" where appropriate.

A. \( \lim_{x \to \infty} \frac{-5}{x} = 0 \)

B. \( \lim_{x \to -\infty} \frac{3x^2 - 4x^3}{x^4} = \frac{3}{x} \) and \( \lim_{x \to -\infty} (-4)^3 i^3 = 0 \)

C. \( \lim_{x \to \infty} \frac{-3x^2 + 2x}{x^4 - 8} = 0 \)

Q3: Answer these questions about \( f(x) = \frac{5x + 3}{x - 2} \)

A. What is the domain of \( f(x) \)? Use interval notation. \((-\infty, 2) \cup (2, +\infty)\)

B. At what \( x \) value(s) is \( f(x) = 0 \)? \( 5x + 3 = 0 \implies x = -\frac{3}{5} \)

C. On what interval(s) is \( f(x) > 0 \)? Show your work.

\[
\begin{array}{c|c|c|c}
 x & f(x) = \frac{5x + 3}{x - 2} \\
 \hline
 -1 & \frac{-5 + 3}{-1 - 2} = \frac{-2}{-3} = + \\
 0 & \frac{0 + 3}{0 - 2} = - \\
 3 & \frac{15 + 3}{3 - 2} = \frac{18}{1} = + \\
 \end{array}
\]

Answer: \( (-\infty, -\frac{3}{5}) \cup (2, +\infty) \)
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1. The two grey lines are not part of the graph, but they are asymptotes for the graph. What are their equations?

   - vertical __________
   - horizontal __________

2. Evaluate the limits.
   Where applicable, use \(-\infty\) or \(+\infty\) instead of "dne"

   \[
   \lim_{x \to -\infty} f(x) = \quad \lim_{x \to +1^+} f(x) =
   \]

3. On what intervals is \( y = f(x) \) continuous? _________________

Q2: Evaluate the limits using \(-\infty\) or \(+\infty\) instead of "does not exist" where appropriate.

A. \[ \lim_{x \to +\infty} \frac{-5}{x} = \quad \]
B. \[ \lim_{x \to +\infty} 3x^2 - 4x^3 = \quad \]
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   \[ \lim_{x \to +\infty} f(x) = \quad \lim_{x \to -\infty} f(x) = \]

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Q2: Evaluate the limits using $-\infty$ or $+\infty$ instead of “does not exist” where appropriate.

A. \[ \lim_{x \to -\infty} \frac{-5}{x} = \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad B. \lim_{x \to -\infty} 3x^2 - 4x^3 = \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad C. \lim_{x \to +\infty} \frac{-3x^2 + 2x}{x^4 - 8} = \]

Q3: Answer these questions about $f(x) = \frac{5x + 3}{x - 2}$

A. What is the domain of $f(x)$? Use interval notation. ____________________________

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   Answer: