

University of Bahrain  
Department of Mathematics  
MATHS101: Calculus I  
Dr. Abdulla Eid



### Worksheet: The limits at infinity and infinite limits

Students' Name: \_\_\_\_\_

1. Find the following limits at infinity:

1.  $\lim_{x \rightarrow \infty} \frac{5x^2 - 2x + 1}{9x^2}$

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2.  $\lim_{x \rightarrow -\infty} \frac{5x^3 - 2x + 1}{9x^8 + 8}$

$$3. \lim_{x \rightarrow -\infty} \frac{\sqrt{3x^2 + 1}}{3x - 5}$$

$$4. \lim_{x \rightarrow \infty} (x - \sqrt{x^2 + 16})$$

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$$5. \lim_{x \rightarrow 1^-} \frac{3}{x-1}$$

$$6. \lim_{x \rightarrow 2^+} \frac{3}{2-x}$$

$$7. \lim_{x \rightarrow 3} \frac{3x}{x^2-9}$$

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2. Find the vertical asymptote of the function

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