Math Limits

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2a0 $$\lim_{x \to \infty} \frac{1}{x^2}$$

- **Limit a)**: The limit as (x) approaches infinity for (\frac{1}{{x^2}}) is:
  \lim_{{x \to \infty}} \frac{1}{{x^2}} = 0

  As (x) increases without bound, the value of (\frac{1}{{x^2}}) approaches 0 because the denominator grows much faster than the numerator.

2b) $\lim_{x \to -\infty} \frac{1}{x^2}$

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The limit as (x) approaches negative infinity for (\frac{1}{{x^2}}) is:
\lim_{{x \to -\infty}} \frac{1}{{x^2}} = 0

As (x) decreases without bound, the value of (\frac{1}{{x^2}}) approaches 0, similar to part a), because squaring a negative number results in a positive number, which grows larger.

2c): $\lim_{x \to \infty} x^4$

The limit as (x) approaches infinity for (x^4) is:
\lim_{{x \to \infty}} {x^4} = \infty

As (x) increases without bound, the value of (x^4) grows at an increasing rate and approaches infinity.
If you have more expressions or need further assistance, feel free to ask
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Similar to the previous expressions, the term (2x^5) grows at a faster rate than the others, causing the expression to approach infinity.

2d): $\lim_{{x \to \infty}} (2x^4 - 3x^3 + x + 6)$

The limit as (x) approaches infinity for ($2x^4 - 3x^3 + x + 6$) is:
$\lim_{x \to \infty} (2x^4 - 3x^3 + x + 6) = \infty$

As (x) grows larger, the term ($2x^4$) dominates, leading the expression to increase without bound.

- **Limit ii)**: The limit as (x) approaches negative infinity for ($2x^4 - 3x^3 + x + 6$) is:
  $\lim_{x \to -\infty} (2x^4 - 3x^3 + x + 6) = \infty$

  Even though (x) is negative, the highest power term (x^4) will still lead the expression to increase without bound because the even power makes it positive.
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- **Limit iii)**: The limit as (x) approaches infinity for ($2x^5 - 3x^2 + 6$) is:
  $\lim_{x \to \infty} (2x^5 - 3x^2 + 6) = \infty$

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