Calculus Assignment

Evaluate each of the following limits please.

(1) $\lim_{x \to -2} \left(\frac{4x^2 + 5x - 6}{x^3 + 8} \right)$

(2) $\lim_{x \to 5^-} \left([x^2] - [x]^2 \right)$

(3) $\lim_{x \to 1} \left(\frac{7x^3 - 5x - 2}{x^3 - 3x^2 + 3x - 1} \right)$

(4) $\lim_{x \to 4} \left(\frac{4x^2 - 11x - 20}{\sqrt{8x - 7} - 5} \right)$

(5) $\lim_{x \to \infty} \left(\frac{(3 - 2x)^3}{(5x + 4)(x^2 + 3)} \right)$

(6) $\lim_{x \to 3^-} \left(\frac{x - 3}{x - [x]} \right)$

(7) $\lim_{x \to 3^-} \left(\frac{|x^2 - 5x + 6|}{6x^2 - 13x - 15} \right)$

(8) $\lim_{x \to 2} \left(\frac{\sqrt{6x^2 + 1} - 5}{x^3 - 4x^2 + 6x - 4} \right)$

(9) $\lim_{x \to 3} \left(x\sqrt{x - 3} \right)$

(10) $\lim_{x \to \infty} \left(\sqrt{x^2 - 5x} - \sqrt{x^2 + 5} \right)$

(11) $\lim_{x \to \infty} \left(\frac{\sqrt{x + \sqrt{x + \sqrt{x}}}}{\sqrt{x + 1}} \right)$

(12) $\lim_{x \to 4} \left(\frac{\sqrt[3]{6x + 3} - 3}{\sqrt{8x - 7} - 5} \right)$

(13) $\lim_{x \to \infty} \left(\frac{2^{x+2} + 2^{x-2}}{2^{x-1} - 3} \right)$

(14) $\lim_{x \to \infty} \left(\frac{x^{30}}{x!} \right)$

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Answers

(1) $-\frac{11}{12}$

(2) 8

(3) ∞

(4) $\frac{105}{4}$

(5) $-\frac{8}{5}$

(6) 0

(7) $-\frac{1}{23}$

(8) $\frac{6}{5}$

(9) Does not exist

(10) $-\frac{5}{2}$

(11) 1

(12) $\frac{5}{18}$

(13) $\frac{17}{2}$

(14) 0