

Limits at Infinity – Multiple Choice

1. Evaluate: $\lim_{x \rightarrow \infty} \frac{\sqrt{x^2 - 14}}{3 - 2x}$

- (A) $-\infty$
 (B) $-\frac{1}{2}$
 (C) $\frac{1}{2}$
 (D) $\frac{\sqrt{14}}{3}$
 (E) ∞

2. $\lim_{x \rightarrow \infty} \frac{-4 + x^2}{4x^2 + x - 2}$ is:

- (A) -2
 (B) $-\frac{1}{4}$
 (C) 1
 (D) 2
 (E) Nonexistent

3. $\lim_{x \rightarrow \infty} \frac{5x^3 + 27}{20x^2 + 10x + 9}$ is:

- (A) $-\infty$
 (B) -1
 (C) 0
 (D) 3
 (E) ∞

4. The graph of $y = \frac{2x^2 + 2x + 3}{4x^2 + 4x}$ has

- (A) a horizontal asymptote at $y = \pm \frac{1}{2}$ but no vertical asymptote
 (B) no horizontal asymptote but two vertical asymptotes, at $x = 0$ and $x = 1$
 (C) a horizontal asymptote at $y = \frac{1}{2}$ and two vertical asymptotes, at $x = 0$ and $x = 1$
 (D) a horizontal asymptote at $x = 2$ but no vertical asymptote
 (E) a horizontal asymptote at $y = \frac{1}{2}$ and two vertical asymptotes, at $x = \pm 1$