Name _____ Quiz C11

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(1) What is the average rate of change of the function f given by $f(x) = x^4 - 5x$ on the closed interval $[0, 3]$?

(A) 8.5
(B) 8.7
(C) 22
(D) 33
(E) 66

(2) The position of a particle moving along a line is given by $s(t) = 2t^3 - 24t^2 + 90t + 7$ for $t \geq 0$. For what values of t is the speed of the particle increasing?

(A) $3 < t < 4$ only
(B) $t > 4$ only
(C) $t > 5$ only
(D) $0 < t < 3$ and $t > 5$
(E) $3 < t < 4$ and $t > 5$

(3) $\int (x-1)\sqrt{x}\, dx =$

(A) $\frac{3}{2}\sqrt{x} - \frac{1}{\sqrt{x}} + C$

(B) $\frac{2}{3}x^{3/2} + \frac{1}{2}x^{1/2} + C$

(C) $\frac{1}{2}x^2 - x + C$

(D) $\frac{2}{5}x^{5/2} - \frac{2}{3}x^{3/2} + C$

(E) $\frac{1}{2}x^2 + 2x^{3/2} - x + C$

(4) What is $\lim_{x \to \infty} \frac{x^2 - 4}{2 + x - 4x^2}$?

(A) -2
(B) $-\frac{1}{4}$
(C) $\frac{1}{2}$
(D) 1
(E) The limit does not exist.

(5) Which of the following is the solution to the differential equation $\frac{dy}{dx} = \frac{4x}{y}$, where $y(2) = -2$?

(A) $y = 2x$ for $x > 0$
(B) $y = 2x - 6$ for $x \neq 3$
(C) $y = -\sqrt{4x^2 - 12}$ for $x > \sqrt{3}$
(D) $y = \sqrt{4x^2 - 12}$ for $x > \sqrt{3}$
(E) $y = -\sqrt{4x^2 - 6}$ for $x > \sqrt{1.5}$