Math 108
Spring 2024
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Quiz 2
Show all your work

Score: ___/10

Problem 1: Consider a CapU athlete running a $40\,\text{m}$ dash. The position of the athlete is given by
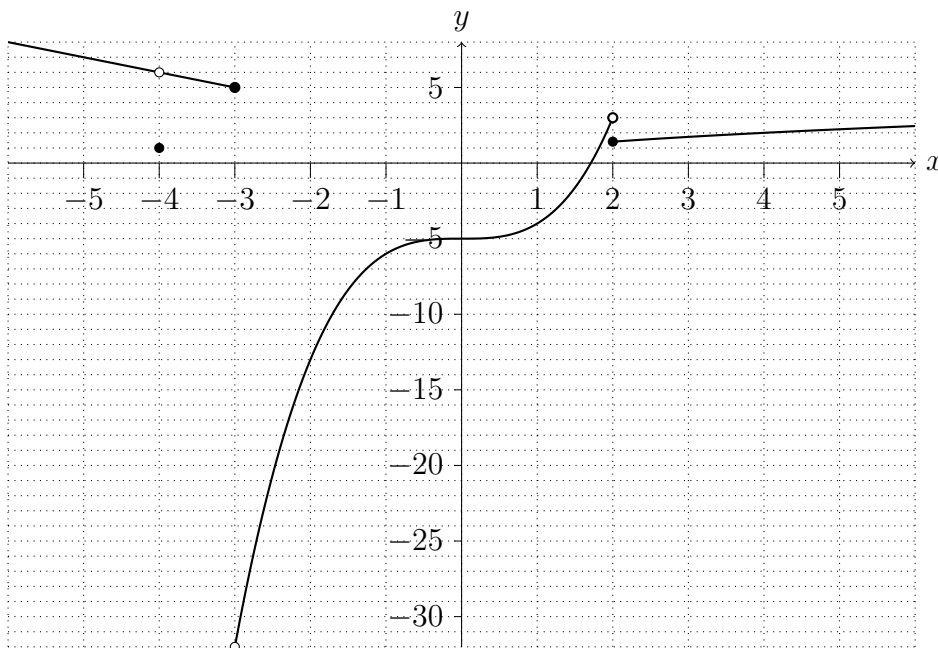
$$d(t) = \frac{t^3}{7} + 4t,$$

where d is the position in meters and t is the time elapsed, measured in seconds. Use a permissible graphing calculator (TI83, TI83+, TI84-Plus) to make a table of values of average velocity of the athlete in order to find the instantaneous velocity **two** seconds after the runner began the dash. Clearly state your Y_1 and Y_2 from your graphing calculator.

Interval	Y_2
$1.000\,\text{s}$–$2.000\,\text{s}$	$5.000\,\text{m/s}$
$1.500\,\text{s}$–$2.000\,\text{s}$	$5.321\,\text{m/s}$
$1.900\,\text{s}$–$2.000\,\text{s}$	$5.630\,\text{m/s}$
$1.990\,\text{s}$–$2.000\,\text{s}$	$5.706\,\text{m/s}$
$2.000\,\text{s}$–$2.010\,\text{s}$	$5.723\,\text{m/s}$
$2.000\,\text{s}$–$2.001\,\text{s}$	$5.715\,\text{m/s}$
Limit	$5.714\,\text{m/s}$

$$Y_1 = x^3/7 + 4x, \quad Y_2 = (Y_1(x) - Y_1(2))/(x - 2)$$

Score: ___/4

Problem 2: Answer the following questions according to the graph of $y = f(x)$ as shown. Note three hollow dots: $(-4, 6)$, $(-3, -32)$, and $(2, 3)$; also two solid dots $(-3, 5)$, and $(2, \sqrt{2})$.

a. $\displaystyle\lim_{x \to -3} f(x) =$ $\boxed{\text{DNE}}$

b. $\displaystyle\lim_{x \to -4} f(x) =$ $\boxed{6}$

c. $f(-4) =$ $\boxed{1}$

d. $\displaystyle\lim_{x \to 2^-} f(x) =$ $\boxed{3}$

e. $\displaystyle\lim_{x \to -5} \frac{f(x) - 7}{x + 5} =$ $\boxed{-1}$

Score: ___/6