Last name: _____

First name: _____

Section: _____

Question:	1	2	Total
Points:	10	10	20
Score:			

Instructions: You must answer all the questions below and give your solutions to the TA at the end of the recitation. Write your solutions directly on the worksheet. Late worksheet will not be accepted.

—————————————— QUESTION 1 —————————————— **(10 pts)**

Compute the average velocity of an object on the time interval $[2, 4]$ if its position function is $s(t) = t^2 - 2$.

$$V_{ave} = \frac{s(4) - s(2)}{4 - 2}.$$

$$s(4) = 16 - 2 = 14$$
$$s(2) = 4 - 2 = 2$$

$$\longrightarrow \quad S_{ave} = \frac{14 - 2}{2} = 6$$

So,

$$\boxed{V_{ave} = 6 \ m/s}$$

Using a table (or the graph of the function), guess the value of the following limits. When the limit is infinite, state if it is $+\infty$ or $-\infty$.

(a) (5 points) $\lim\limits_{x\to 0} \dfrac{x}{x^2 - x}$. $\longrightarrow = f(x)$

(b) (5 points) $\lim\limits_{x\to 1^-} \dfrac{x}{x^2 - x}$. $\longrightarrow = f(x)$

(a) When $x \neq 0$, $\quad \dfrac{x}{x^2 - x} = \dfrac{1}{x-1}$

x	$f(x)$
0.1	$-10/9$
0.01	$-100/99$
0.001	$-1000/999$
-0.001	$-999/1001$
-0.01	$-99/101$
-0.1	$-9/11$

$\Rightarrow$

$$\boxed{\lim_{x\to 0} \frac{x}{x^2-1} = -1}$$

(b) Again, $x \neq 0$, $\quad \dfrac{x}{x^2 - x} = \dfrac{1}{x-1}$

x	$f(x)$
0.9	-10
0.99	-100
0.999	-1000
0.9999	-10000
$\downarrow$	$\downarrow$
1^-	$-\infty$

$\Rightarrow$

$$\boxed{\lim_{x\to 1^-} \frac{x}{x^2-1} = -\infty}$$