Name: _____   **Section**: _____

Clear your desk of everything excepts pens, pencils and erasers. **Show all your work.**
If you have a question raise your hand and I will come to you.

1. (1 point) **Multiple Choice. Circle the best answer. No partial credit available**

   If the position (in meters) of a moving object is given by $p(t) = 2t - t^2$, for time t in seconds, then what is the average velocity of the object over the interval $[0, 1]$?

   A. 0.5 m/s

   B. **1 m/s**

   C. 1.5 m/s

   D. 2 m/s

   E. None of the above.

2. (2 points) **Fill-in-the-Blank.**
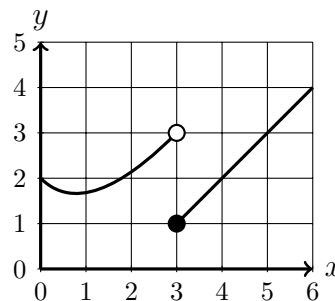
   Consider the graph of $f(x)$ to the right. Evaluate the following, or write "does not exist".

   (a) $f(3) = $ <u>1</u>_____

   (b) $\lim\limits_{x \to 3^-} f(x) = $ <u>3</u>_____

   (c) $\lim\limits_{x \to 3^+} f(x) = $ <u>1</u>_____

   (d) $\lim\limits_{x \to 3} f(x) = $ <u>does not exist</u>_____

3. (1 point) Give an example of a function $f(x)$ for which:

- $\lim_{x \to 0^-} f(x) = -\infty$
- $\lim_{x \to 0^+} f(x) = \infty$

Either give a formula for $f(x)$, or sketch a graph (or both).

Solution: An easy example would be $f(x) = \frac{1}{x}$.

4. (1 point) **Show your work to receive credit.**

Evaluate $\lim_{x \to 3} \dfrac{x^2 - 10x + 21}{x - 3}$.

Solution:

$$
\begin{aligned}
\lim_{x \to 3} \frac{x^2 - 10x + 21}{x - 3} &= \lim_{x \to 3} \frac{(x - 3)(x - 7)}{x - 3} \\
&= \lim_{x \to 3} (x - 7) \\
&= 3 - 7 \\
&= -4
\end{aligned}
$$

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