

Show all work. Arithmetic expressions do not need to be simplified in your final answer.

1. **(7 points)** This is the record of the first 5 minutes of a bicyclist's trip:

Time elapsed (in minutes)	0	1	2	3	4	5
Distance traveled (in meters)	0	300	700	1050	1500	1800

- (a) **(2 points)** What is the bicyclist's average speed in the first two minutes of their journey?

- (b) **(2 points)** What is the bicyclist's average speed between the times $t = 1$ and $t = 4$?

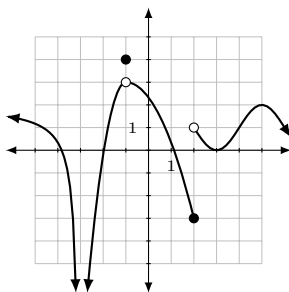
- (c) **(3 points)** The detailed records indicate that after 4.1 minutes (or 246 seconds), the bicycle had gone 1539 meters. Based on this information, what would be a good estimate for the instantaneous speed after 4 minutes?

2. **(7 points)** Calculate the following limits:

(a) $\lim_{s \rightarrow 3} \frac{s^2 - 6s + 9}{2s^2 - 5s - 3}$.

(b) $\lim_{r \rightarrow -2} \frac{r^3 - 3r}{r^2 + r - 1}$.

3. **(6 points)** Below is the graph of a function $f(x)$. For each of the six quantities listed, give its value if it has a value, or specifically state that it does not exist.



$\lim_{x \rightarrow -3} f(x)$

$\lim_{x \rightarrow 1} f(x)$

$\lim_{x \rightarrow -1^+} f(x)$

$f(1)$

$f(-1)$

$\lim_{x \rightarrow 2^+} f(3)$

4. **(2 point bonus)** If $f(x)$ is an even function, and $g(x)$ is an odd function, what do you know for certain about the parity of $f(f(x))$, $f(g(x))$, $g(f(x))$, and $g(g(x))$? Show your work on the back of this page.