## Math 131A Winter 2018: Homework 8, Due 3/16

1-2. 28.8, 28.10.

3-4. 29.5, 29.12.
5. Let $f:(a, b) \rightarrow \mathbb{R}$ be differentiable and let $c \in(a, b)$. Suppose that $\lim _{x \rightarrow c} f^{\prime}(x)$ exists and is finite. Show that this limit must be $f^{\prime}(c)$.
6. Let $f:[a, b] \rightarrow \mathbb{R}$ be continuous, and differentiable on $(a, b)$. Assume that $f^{\prime}$ is strictly increasing. Show that for any $c \in(a, b)$ such that $f^{\prime}(c)=0$ there exist $x_{1}, x_{2} \in[a, b], x_{1}<c<x_{2}$ such that

$$
f^{\prime}(c)=\frac{f\left(x_{2}\right)-f\left(x_{1}\right)}{x_{2}-x_{1}}
$$

7-8. 32.3, 32.6.
[Suggested Exercises that will not be graded:] 28.15, 32.7, 32.8. 33.4, 33.6.

