Finish proof of $|ab| = |a||b|$ (cases 2 & 4). Cases 1 & 3 done in class.

Section 3, p. 19: #5, 6, 7, 8 [See hints below.]

#3.5(a) This proof justifies taking off absolute values, [e.g. $|x-3| < 4$ can be written as $-4 < x-3 < 4$.]

Remember it is an if and only if problem, so you must prove both "If A, then B" ($\Rightarrow$:) and "If B, then A" ($\Leftarrow$:).

$\Rightarrow$: Show $-a \le b$ and $b \le a$ separately.

$\Leftarrow$: Use 2 cases: $b \ge 0$ and $b < 0$.

#3.5(b) If you can show $-|a-b| \le |a| - |b| \le |a-b|$, then you can use part (a). Show $-|a-b| \le |a| - |b|$ and $|a| - |b| \le |a-b|$ separately.

#3.6 How do you mathematically make 3 (or more) things into 2 things?

#3.8 [I am introducing a part(a) to prove first which will help to prove the original question.]

(a) Prove: Let $a, b \in \mathbb{R}$. If $a > b$, then $b_1^* = b + \dfrac{1}{2}|a-b|$ is between b and a [i.e. $b < b_1^* < a$].

Before you prove part(a), draw a number line with a, b, and b_1^*. From this picture, describe specifically how the point b_1^* is related to a and b.

(b) Use contradiction (and at some point, part (a)) to prove the original #3.8:

Let $a, b \in \mathbb{R}$. Show that if $a \le b_1 \ \forall\, b_1 > b$, then $a \le b$.