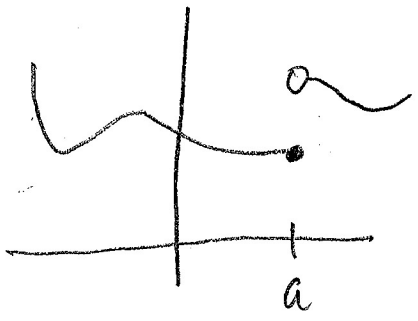
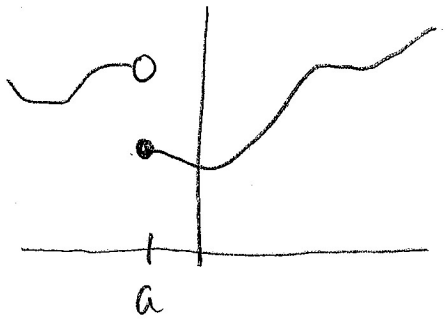
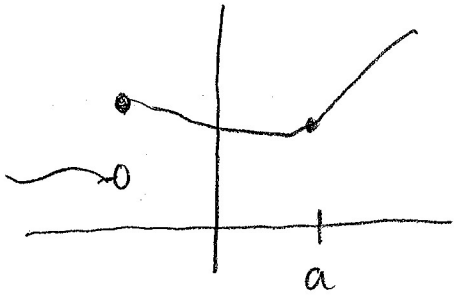
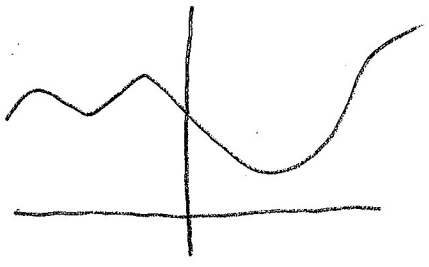
RECAP DAY 8
18 FEB 22

# CONTINUITY

a is in the domain of $f(x)$

| | | |
|---|---|---|
| Continuous from the left at a |   | $\lim_{x \to a^-} f(x)$ exists<br>$\lim_{x \to a^-} f(x) = f(a)$ |
| Continuous from the right at a |   | $\lim_{x \to a^+} f(x)$ exists<br>$\lim_{x \to a^+} f(x) = f(a)$ |
| Continuous at a |   | $\lim_{x \to a^-} f(x)$, $\lim_{x \to a^+} f(x)$ exist.<br>$\lim_{x \to a^-} f(x) = \lim_{x \to a^+} f(x) = f(a)$ |
| Continuous |  | $f(x)$ is continuous at <u>every</u> a in the domain. |

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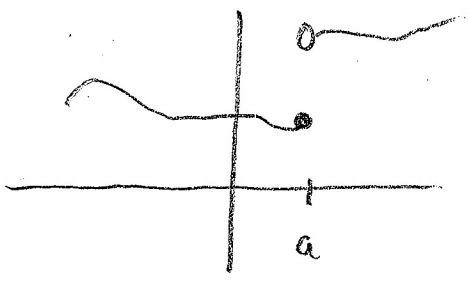
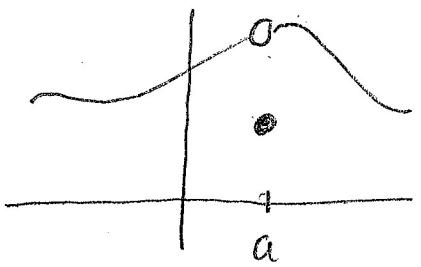
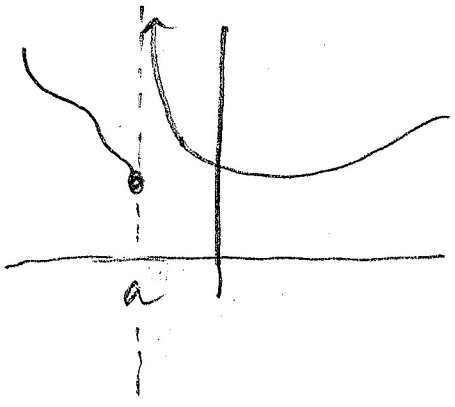
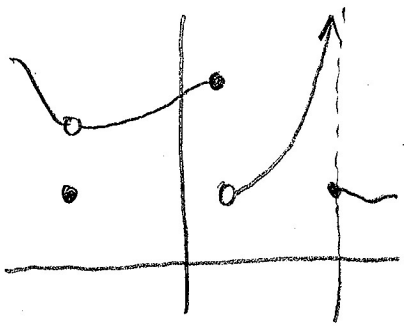
# DISCONTINUITY

$a$ is in the domain of $f(x)$

| | | |
|---|---|---|
| Jump discontinuity |   | $\lim_{x\to a^-} f(x)$, $\lim_{x\to a^+} f(x)$ exist. $\lim_{x\to a^-} f(x) \neq \lim_{x\to a^+} f(x)$ |
| Removable discontinuity |   | $\lim_{x\to a^-} f(x)$, $\lim_{x\to a^+} f(x)$ exist. $\lim_{x\to a^-} f(x) = \lim_{x\to a^+} f(x) \neq f(a)$ |
| Infinite discontinuity |   | One or both of $\lim_{x\to a^-} f(x)$, $\lim_{x\to a^+} f(x)$ does not exist (vertical asymptote) |
| Discontinuous |  | $f(x)$ is discontinuous at <u>some</u> $a$ in the domain. |