AP Calculus Name: _____
Continuity (2.4) Worksheet

For each of the following, where $\lim_{x\to a} f(x)$

a) Evaluate $f(a)$ if it is defined
b) Evaluate the limit (numerically, graphically & algebraically, if possible) if it exists. Consider the one-sided limits.
c) Sketch the graph near x=*a*
d) Is $f(x)$ continuous at x=*a*?

A function *f* is **continuous** at x=*a* if all three of the following are true:

1. $\lim_{x\to a} f(x) = L$ (the limit exists)
2. $f(a) = M$ (the function is defined)
3. $L = M$

1. $\lim_{x\to 3}(2x-1)$	2. $\lim_{x\to 1}\dfrac{x^2-1}{x-1}$
3. $\lim_{x\to 2}\dfrac{x^3+x^2-11x+10}{x-2}$	4. $\lim_{x\to 0}\dfrac{\lvert x\rvert}{x}$
5. $\lim_{x\to 1} F(x)$, where $F(x)=\begin{cases}2x+3, & x<1\\ 4, & x=1\\ x^2+1, & x>1\end{cases}$	6. $\lim_{x\to 0}(1+x)^{\frac{1}{x}}$
7. $\lim_{x\to 1} g(x)$, where $g(x)=\begin{cases}\cos x, & x\le 1\\ x^2+1, & x>1\end{cases}$	8. $\lim_{x\to -1}([x]+2)$
9. $\lim_{x\to 4}\dfrac{1}{x-4}$	10. $\lim_{x\to 0}\sin\left(\dfrac{1}{x}\right)$