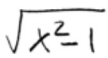
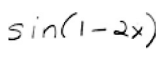
Keyboarding Tip Sheet for the 2020 AP Calculus Exams

Students may complete their responses for the 2020 AP Calculus AB and AP Calculus BC Exams either by uploading a photo of their handwritten response or by typing on a computer or other electronic device. This Keyboarding Guide provides standard ways of entering common mathematical expressions using a standard keyboard.

- **For easier readability**, use a serif font (recommended: Times New Roman). Differentiating between capital I and lowercase l is difficult in some fonts. For example: Calibri: I vs l
- **If working with word-processing software**, you may find it helpful to turn off in advance the autocorrect feature to avoid text like (c) converting to ©, or automatic capitalization and autocorrect giving an incorrect symbol, which will take time to fix.
  You do not need to simplify numeric answers. To avoid the risk of arithmetic or simplification errors, you are encouraged to leave numerical answers as unsimplified expressions.
- **You may abbreviate** the Intermediate Value Theorem, the Extreme Value Theorem, Mean Value Theorem, and the Fundamental Theorem of Calculus as "IVT", "EVT", "MVT", and "FTC" respectively.

Tip #1: Use parentheses or other grouping symbols to communicate your intended order of operations, especially with fractional expressions, exponents, and arguments of mathematical functions.

Handwritten:				
Keyboarded	(3-2)/(5-2)	e^(2x-1) *Use ^ to start an exponent.*	sqrt(x^2-1)	sin(1-2x)
Do Not Use:	NOT: 3-2/5-2 $3 - \frac{2}{5} - 2$	NOT: e^2x-1 $e^{2x} - 1$	NOT: sqrtx^2-1 $\sqrt{x^2} - 1$	NOT: sin1-2x

Tip #2: Use the regular characters available on your keyboard to save time and confusion.

Special characters	π	∞	$\pm$	$3 \le x < 5$
Keyboard	pi	infinity	+/-	3<=x<5 Or [3, 5)

Tip #3: Words may be used to express many operations and expressions.

Operation/ Expression	$\sqrt[3]{x-1}$	$\frac{54}{x-1}$	$\ln\lvert 2x-1\rvert$	$\tan^{-1} x$
Keyboard	Cube root of (x-1) or (x-1)^(1/3)	54/(x-1)	ln|2x-1| ln (abs(2x-1))	arctan x or inverse tangent(x)
Operation/ Expression	$\lim_{x\to\infty} \frac{2x-1}{3x+1}$	$\lim_{x\to 0^+} \ln x$	$\frac{dy}{dx}$ or $\frac{d^2y}{dx^2}$	a_n
Keyboard	Limit x -> infinity of (2x-1)/(3x+1)	Limit x->0+ of lnx	For y=f(x), write f '(x) or f ''(x)	a sub n
Operation/ Expression	$\int_a^b (x^2-1)dx$		$\sum_{n=1}^{\infty} \frac{(-1)^n a_n}{(n+1)!}$	
Keyboard	Integral from a to b of (x^2-1)dx Do not write "a-b" for "a to b."		Sum from n=1 to infinity of (-1)^n*(a sub n)/ (n+1)!	