AP Calculus AB
Worksheet: Are you Ready?

1. State the definition of the derivative at x = a.

2. State the definition of the derivative function.

3. State three different interpretations of f ' (a).

4. $\frac{d}{dx}\,(f(x))^n = ?$

5. $\frac{d}{dx}[f(x) \cdot g(x)] = ?$

6. $\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) = ?$

7. $\frac{d}{dx}(\sin(f(x))) = ?$

8. $\frac{d}{dx}(\cos(f(x))) = ?$

9. $\frac{d}{dx}(\ln(f(x))) = ?$

10. $\frac{d}{dx}\,e^{f(x)} = ?$

11. $\frac{d}{dx}\,a^{f(x)} = ?$

12. $\frac{d}{dx}\,\sin^{-1} f(x) = ?$

13. $\frac{d}{dx}\,\tan^{-1} f(x) = ?$

14. You are asked to find the limit of a quotient function as x approaches some number ***a*** but you get $\frac{0}{0}$. What should you do?

15. The equation of the tangent line to the curve y = f(x) at x = a is given by

What about the equation of the normal line to the same curve at the same point?

16. A function is said to be increasing on an interval if its derivative is

17. State two ways to justify that the graph of a function is concave upward on an interval.

18. You are given that f ' (a) = 0. State two ways that you can show that f(a) is a local extrema of the curve y = f(x).

19. A function is continuous on the interval [a, b]. What do you know about global extrema on the interval? Where must they occur?

20. You are given that a function, f, is continuous on the interval [a, b] and differentiable on the interval (a, b). You are asked to find the value of ***c***, on (a, b), that satisfies the conclusion of the Mean Value Theorem. Which ***c*** is that?

21. Which three conditions must be met for a function to be continuous at x = c?

22. Suppose for a given function, f(x), f '(a) = 0 and f''(a) < 0. What can you conclude about f(a)?

23. Given $\lim_{x \to \infty} f(x) = 3$. What special feature for the graph of f(x) does this imply?

24. Suppose *f* is a polynomial function of degree 3 with a positive leading coefficient. If x = 1 and x = 5 are critical values of *f* which of the two will produce a local minimum? Why?

25. Suppose you were given a table of function values as illustrated below.

x	a	b	c	d	e
f (x)	f (a)	f (b)	f (c)	f (d)	f (e)

Write an expression that represents the average rate of change of *f* on [a, b].

How can you approximate the instantaneous rate of change of *f* at x = c?

Suppose *f* represents a rate of change. Write an expression that approximates the total change of *f* on [a, b].