

Lecture 15

Tuesday, October 25, 2022 7:56 AM

* Question

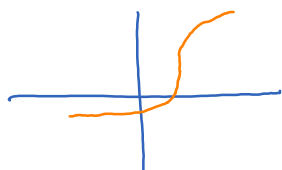
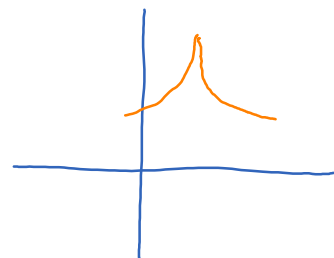
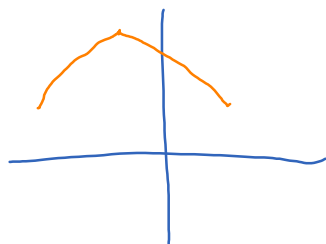
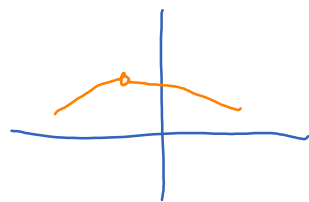
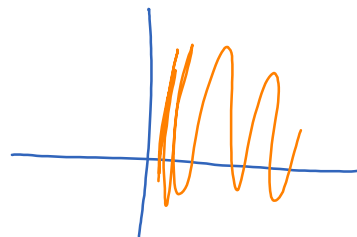
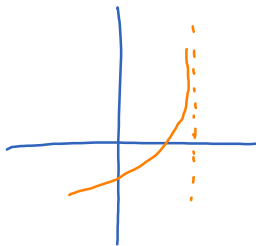
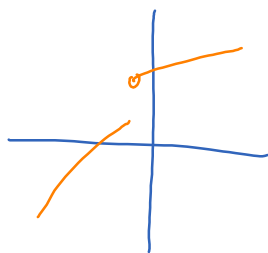
Review: f is differentiable at a if $f'(a)$ exists.

$$\lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h} \text{ exists}$$

f has a well-defined nonvertical tangent line at a .

If f is differentiable at any point on an interval (c,d) , we say that f is differentiable on (a,b) .

What can go wrong? If f is not continuous, it is not differentiable.



Work on the worksheet.

Differentiation rules

- Power rule: $(x^n)' = nx^{n-1}$
- Constant multiple rule: $(cf(x))' = cf'(x)$
- Sum rule $(f(x) + g(x))' = f'(x) + g'(x)$
- Product rule $(fg)' = f'g + g'f$
- Quotient rule $\left(\frac{f}{g}\right)' = \frac{f'g - g'f}{g^2}$