Weekly Assignment 5

1. Product rule
	1. Draw a diagram with an accomplanying explanation to justify that as *h* goes to zero, *f(a+h) = f(a) + h\*f’(a)*
	2. Use the results of part a and the algebraic definition to justify the product rule for $\frac{d}{dx}(f\left(x\right)\*g\left(x\right))$
	3. Reciprocal Rule: Use the previous problem and the algebraic definition to find $\frac{d}{dx}(\frac{1}{f(x)})$
2. Quotient rule: Use the reciprocal rule and the product rule to find $\frac{d}{dx}(\frac{f(x)}{g(x)})$
3. Use the reciprocal or quotient rules for derivatives to verify the following formulas for the derivatives of other trig functions:
	1. If *f(x) = tan(x)* then $f'\left(x\right)=sec^{2}(x)$
	2. If *f(x) = cot(x)* then $f'\left(x\right)=-csc^{2}(x)$
	3. If *f(x) = sec(x)* then *f’(x)= sec(x)tan(x)*
	4. If *f(x) = csc(x)* then *f’(x)= -csc(x)cot(x)*
4. Given the following graphs of *f*, draw the graph of *f’*:

|  |  |
| --- | --- |
| See the source image | Chart  Description automatically generated |