Chapter 2 Section 6

Section 2.5 Example 6 solution rewrite

Recognize that we have the function $g(x) = \tan(6x^3 - 7x)$ "inside" the function $f(x) = x^5$; that is, we have $y = \big(\tan(6x^3 - 7x)\big)^5$. We use the Chain Rule multiple times, beginning with the Generalized Power Rule:

$$\begin{aligned} y' &= 5\big(\tan(6x^3 - 7x)\big)^4 \cdot \frac{d}{dx}\tan(6x^3 - 7x) \\ &= 5\tan^4(6x^3 - 7x) \cdot \sec^2(6x^3 - 7x) \cdot \frac{d}{dx}(6x^3 - 7x) \\ &= 5\tan^4(6x^3 - 7x) \cdot \sec^2(6x^3 - 7x) \cdot (18x^2 - 7) \\ &= 5(18x^2 - 7)\tan^4(6x^3 - 7x)\sec^2(6x^3 - 7x) \end{aligned}$$

Section 2.6

Please change the video to: https://www.khanacademy.org/math/differential-calculus/taking-derivatives/implicit-differentiation/v/showing-explicit-and-implicit-differentiation-give-same-result

Example 2.6.4 (formerly #70) I was supposed to add a few steps to the first part of the solution.

$$\begin{aligned} \frac{d}{dx}\big(\sin(x^2y^2)\big) &= \cos(x^2y^2) \cdot \frac{d}{dx}(x^2y^2) \\ &= \cos(x^2y^2) \cdot \big(x^2\frac{d}{dx}(y^2) + \frac{d}{dx}(x^2) \cdot y^2\big) \\ &= \cos(x^2y^2) \cdot (x^2 \cdot 2yy' + 2y^2) \\ &= 2(x^2yy' + y^2)\cos(x^2y^2). \end{aligned}$$

Thank you for graphing and adding a point to that "find the euqation of the tangent line" function I added.