

Chain Rule - Dist Equation

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12:51 AM

$$\frac{d}{dx} \left(\sqrt{(a-x)^2 + (b+c)^2} \right)$$

It is the form of the equation that is important here
Not the variable names themselves so I have made
some substitution to make it easier to follow.

rewritten
equals $\frac{d}{dx} \left((a-x)^2 + (b+c)^2 \right)^{\frac{1}{2}}$

u - substitution + chain rule

Let $g(x) = u = (a-x)^2 + (b+c)^2$

$$f(u) = u^{\frac{1}{2}}$$

$$F(x) = f(g(x))$$

$$F'(x) = f'(g'(x))$$

constant
 $\frac{d}{dx} = 0$

$$\frac{1}{2} u^{-\frac{1}{2}} (-2a + 2x) \quad \left| \begin{array}{l} (a-x)(a-x) \\ a^2 - 2ax + x^2 \\ \Downarrow \\ g'(x) = -2a + 2x \end{array} \right.$$
$$\frac{1}{2} \left[(a-x)^2 + (b+c)^2 \right]^{-\frac{1}{2}} (-2a + 2x)$$