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Test 2

$$\frac{dy}{dx} = y'$$

R 1

$$y = \frac{x^2}{2x+1}$$

$$u = x^2$$

$$v = 2x+1$$

$$u' = 2x$$

$$v' = 2$$

$$y = x^2 (2x+1)^{-1}$$

$$y' = (2x \times 2) - (2x \times x^2)$$

$$y' = \frac{(2x \times 2x+1) - (2x \times x^2)}{(2x+1)^2}$$

$$y' = \frac{(4x^2+2x) - (2x^2)}{(2x+1)^2}$$

$$y' = \frac{(4x^2+2x) - (2x^2)}{(2x+1)(2x+1)}$$

$$4x^2 + 4x + 1$$

$$y' = \frac{2x - 2x^2}{4x+1}$$

ii

$$y = \sqrt{x^2+1}$$

$$y = (x^2+1)^{1/2}$$

$$y' = \frac{1}{2} (x^2+1)^{-1/2}$$

iii

$$y = 3x^{3/2} + \frac{3}{x^2} - 6x$$

$$y = 3x^{3/2} + 3x^{-2} - 6x$$

$$\frac{dy}{dx} = 4.5x^{1/2} + -6x^{-3} - 6$$

iv.

$$y = \sec^3 4x$$

$$3 \sec^2(4x) \times u'$$

$$3 \sec^2(4x) \times (\sec(4x))'$$

$$3 \sec^2(4x) \times \sec(4x) \times 4 \times \sec(4x) \times \tan(4x)$$