

## Differentiation Exam Review:

$$\textcircled{1} \text{ d, } y = (5-2x^2)^x$$

$$\ln y = \ln(5-2x^2)^x$$

$$\ln y = x \ln(5-2x^2)$$

$$\cancel{y} \cdot \frac{y'}{y} = \left[ x \left( \frac{-4x}{5-2x^2} \right) + \ln(5-2x^2) \right] \cdot y$$

$$y' = \left[ \frac{-4x^2}{5-2x^2} + \ln(5-2x^2) \right] (5-2x^2)^x$$

$$\textcircled{3} e^{3x-y^5} = 5^{xy^3}$$

$$3xy^2y' + y^3$$

$$e^{3x-y^5} (3 - 5y^4 y') = 5^{xy^3} (\ln 5) [x(3y^2 y') + y^3]$$

$$3e^{3x-y^5} - 5y^4 y' e^{3x-y^5} = 5^{xy^3} \ln 5 (3xy^2 y') + 5^{xy^3} \ln 5 y^3$$

$$3e^{3x-y^5} - 5^{xy^3} \ln 5 y^3 = 3xy^2 5^{xy^3} \ln 5 y' + 5y^4 y' e^{3x-y^5}$$

$$3e^{3x-y^5} - 5^{xy^3} \ln 5 y^3 = y' [3xy^2 5^{xy^3} \ln 5 + 5y^4 e^{3x-y^5}]$$

$$\frac{3e^{3x-y^5} - 5^{xy^3} \ln 5 y^3}{3xy^2 5^{xy^3} \ln 5 + 5y^4 e^{3x-y^5}} = y'$$