

INTRODUCTION TO CALCULUS

MATH 1A

UNIT 17: WORKSHEET

Problem 1: Find the derivative of $\sqrt{1+x^2}$ using the chain rule.

Solution:

$$x/\sqrt{1+x^2}$$

Problem 2: Find the derivative of $\sin^3(x)$ using the **product rule**.

Solution:

$$\cos(x) \sin^2(x) + \sin(x) \frac{d}{dx} \sin^2(x) = \cos(x) \sin^2(x) + \sin(x)(\cos(x) \sin(x) + \sin(x) \cos(x))$$

Problem 3: Find the derivative of $\sin^3(x)$ using the **chain rule**.

Solution:

$$3 \sin^2(x) \cos(x).$$

Problem 4: Find the derivative of $\tan(\sin(x))$.

Solution:

$$\frac{1}{\cos^2(\sin(x))} \cos(x)$$

Problem 5: Find the derivative of $\sin(\cos(\exp(x)))$.**Solution:**

$$\cos(\cos(e^x))(-\sin(e^x))e^x.$$

Problem 6: Find the derivative of e^{-x^2} using the chain rule.**Solution:**

$$-2xe^{-x^2}.$$

Problem 7: Find the derivative of $\ln(\ln(\ln(x)))$ using the chain rule.**Solution:**

$$\frac{1}{\ln \ln(x)} \frac{1}{\ln(x)} \frac{1}{x}.$$