

Homework for Math 352  
Spring 2020

Hwk Set 11. Due Wednesday, April 8.

1. Prove that  $(1 - x) \sum_{k=m+1}^{n-1} x^k = x^{m+1}(1 - x^{n-m-1})$ . (This is used in the proof of Abel's Theorem.)

2. Using only the definition of the derivative and the Rules for Limits derive the derivatives of the two functions below.

a.  $f(x) = \sqrt{3x + 2}$     b.  $g(x) = \frac{x}{x-1}$ .

3. Using the Rules for Derivatives find the derivatives of the two functions below. You may assume the standard results about derivatives of trigonometric, logarithmic and exponential functions.

a.  $h(x) = \sqrt{e^{\cos 2x} + x}$ .    b.  $p(x) = \sec^3(\ln 4x^2 + 1)$ .

4. Let  $f(x) = x + x^2 + x^3 + x^4$  on  $[0, 1]$ . Show that  $f(x) = 1$  for one and only one value  $x \in [0, 1]$ . Hint: Use the IVT and the MVT.

28.4 a, b, c.

29.4

29.5