Section 3.3 Rules of Differentiation

# Topic 1: Four Rules of Differentiation

**Theorem: Constant Rule**

If *c* is a real number, then .

**Theorem: Power Rule**

If *n* is a real number, then .

**Theorem: Constant Multiple Rule**

If *f* is differentiable at *x* and *c* is a constant, then .

**Theorem: Sum Rule**

If *f* and *g* are differentiable at *x*, then .

**Theorem: Derivative of** $e^{x}$

The function  is differentiable for all real numbers $x$, and .

# Topic 2: Slopes of Tangent Lines

# Topic 3: Higher Order Derivatives

Assuming  can be differentiated, the second derivative of *f* is .

For integers , the *nth* derivative of *f* is .