

## Differentiation Rules Learned Earlier

Derivative of a Constant:  $\frac{d}{dx}(c) = 0$ , if  $c$  is a constant.

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Constant Multiple Rule :  $\frac{d}{dx}[cf(x)] = c\frac{d}{dx}f(x),$

where  $c$  is a constant and  $f$  is a differentiable function.

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## The Sum Rule

If  $f$  and  $g$  are both differentiable at  $x$ ,

then  $f + g$  is differentiable at  $x$  and

$$\frac{d}{dx}[f(x) + g(x)] = \frac{d}{dx}f(x) + \frac{d}{dx}g(x)$$

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### The Difference Rule

If  $f$  and  $g$  are both differentiable at  $x$ ,

then  $f - g$  is differentiable at  $x$  and

$$\frac{d}{dx}[f(x) - g(x)] = \frac{d}{dx}f(x) - \frac{d}{dx}g(x)$$

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Let  $g$  be differentiable and non-zero at  $x$ ,

$$\text{then } \frac{d}{dx} \left( \frac{1}{g(x)} \right) = -\frac{g'(x)}{(g(x))^2}$$