

## Math-71 Sections 9, 11, 12

### Exam #2 Cheat Sheet

#### Derivatives

1.  $\frac{d}{dx}[c] = 0$
2.  $\frac{d}{dx}[x^c] = cx^{c-1}$
3.  $\frac{d}{dx}[cf(x)] = cf'(x)$
4.  $\frac{d}{dx}[f(x) \pm g(x)] = f'(x) \pm g'(x)$
5.  $\frac{d}{dx}[f(x)g(x)] = f(x)g'(x) + f'(x)g(x)$
6.  $\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right] = \frac{g(x)f'(x) - f(x)g'(x)}{[g(x)]^2}$
7.  $\frac{d}{dx}[f(u(x))] = f'(u)u'(x)$
8.  $\frac{d}{dx}[e^x] = e^x$

	$< 0$	$> 0$
$f'(x)$	decreasing	increasing
$f''(x)$	concave down	concave up

#### Transformations

TRANSFORMATION	PATTERN
basic graph	$e^x$
horizontal translation	$e^{x \pm h}$
horizontal scale	$e^{b(x \pm h)}$
horizontal reflection	$e^{-b(x \pm h)}$
vertical scale	$ae^{-b(x \pm h)}$
vertical reflection	$-ae^{-b(x \pm h)}$
vertical translation	$-ae^{-b(x \pm h)} \pm k$

#### Interest

1.  $A = P(1 + rt)$
2.  $A = P\left(1 + \frac{r}{n}\right)^{nt}$
3.  $A = Pe^{rt}$

#### Probability

1.  $p(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{\frac{-(x-\mu)^2}{2\sigma^2}}$
2. 68-95-97.7 rule