MATH 160 Session #23
Using Patterns or Rules to Find Derivatives of Selectied Functions

If f(x) and g(x) are functions whose derivatives exist, and C and r are real numbers, then

$\frac{d}{dx}(C) = 0$

$\frac{d}{dx}(x^r) = rx^{r-1}$

$\frac{d}{dx}(Cf(x)) = C\frac{d}{dx}(f(x))$

$\frac{d}{dx}(f(x) \pm g(x)) = \frac{d}{dx}f(x) \pm \frac{d}{dx}g(x)$

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

$\frac{d}{dx}([f(x)]^r) = r[f(x)]^{r-1}\ \frac{d}{dx}f(x)$

$\frac{d}{dx}(e^x) = e^x$

$\frac{d}{dx}(e^{f(x)}) = e^{f(x)}\ \frac{d}{dx}f(x)$

Use the above patterns (rules) to find the specified derivatives.

1. $\frac{d}{dx}(3x^7 - 12x^4 + 5x^2 + 4x - 23)$

2. $\frac{d}{dx}(2x + 6)^2$

3. $\frac{d}{dx}(e^{0.25x})$

4. $\frac{d}{dx}(100e^{0.07x})$

5. $\frac{d}{dx}(3xe^{0.25x})$

6. $\frac{d}{dx}(5)$

7. $\frac{d}{dx}(20x^2 + 5)^3$

8. $\frac{d}{dx}\sqrt{4x^2 + 3x}$

9. $\frac{d}{dx}20\sqrt{x+3}$

10. $\frac{d}{dx}(\frac{2}{x^2} + \frac{1}{\sqrt{x}})$