Precalc

Review Ch. 15
Quiz 15.4

## Lesson 15-1 *(Pages 941–948)*

**Evaluate each limit.**

1. $\lim_{x \to 4} (x^2 + 2x - 2)$ = 22

5. $\lim_{x \to -2} \dfrac{x^2 + 5x + 6}{x^2 + x - 2}$

At most one problem...

## Lesson 15-2 *(Pages 951–960)*

**Use the definition of derivative to find the derivative of each function.**

1. $f(x) = 5x$

2. $f(x) = 9x - 2$

$\frac{1}{2}$ $2x+4$

**Use the derivative rules to find the derivative of each function.**

3. $f(x) = \frac{1}{2}x + \frac{2}{3}$

4. $f(x) = x^2 + 4x + 8$

$$\lim_{h\to 0} \frac{f(x+h)-f(x)}{h} \quad \frac{\left[(x+h)^2+4(x+h)+8\right]-\left[x^2+4x+8\right]}{h}$$

$$\frac{x^2+2hx+h^2+4x+4h+8-x^2-4x-8}{h}$$

$$\frac{2hx+h^2+4h}{h}$$

$$\lim_{h\to 0} \frac{h(2x+h+4)}{h} \quad f(x)=2x+0+4$$

**Find the antiderivative of each function.**

5. $f(x) = x^5$

$F(x) = \frac{x^6}{6} + C$

6. $f(x) = 2x^2 - 8x + 2$

$2\left(\frac{x^3}{3}\right) - 8\left(\frac{x^2}{2}\right) + 2x + C$

$F(x) = \frac{2}{3}x^3 - 4x^2 + 2x + C$

At most 1 problem...

**Lesson 15-3** *(Pages 961–968)*

**Use limits to evaluate each integral.**

1. $\int_0^3 5x\,dx$ $i = \frac{3}{n}$ $0 + \frac{3i}{n}$

$\lim 5\sum \left(\frac{3i}{n}\right)\frac{3}{n}$

$\lim 5\sum_{i=1}^{\infty} \frac{9i}{n^2}$ $\frac{9(1+2+3\ldots)}{n^2}$

$\lim \frac{9}{n^2}\frac{n(n+1)}{2}$ $\frac{9n+9}{2n}$

$\lim_{n\to\infty} \frac{9}{2} + \frac{9}{n}$

$5\cdot\frac{9}{2} = \frac{45}{2}$

$\frac{5x^2}{2}\Big|_0^3$ $\frac{5\cdot 9}{2} - \frac{5\cdot 0}{2}$

Method of your choice

**Lesson 15-4** *(Pages 970–976)*

**Evaluate each indefinite integral.**

1. $\int x^6\,dx$

$\frac{x^7}{7} + C$

2. $\int 5x^4\,dx$

$5\frac{x^5}{5} = x^5 + C$

Method of your choice

**Evaluate each definite integral.**

5. $\int_{-2}^{2} 14x^6\,dx$

6. $\int_{0}^{6} (x+2)\,dx$

$14 \cdot \frac{x^7}{7}$ 2 -2

$2x^7 \Big|_{-2}^{2}$ $(256) - (-256) = 512$

$-2 \cdot -2 \cdot -2 \ldots$

Product rule
Quotient rule
Friendly functions