

**AP Calculus BC – Unit 4, Part 2 Extra Practice**

**4.5 day 1 – Extra Practice**

Evaluate using u-substitution or Reverse Chain Rule (whichever you prefer)

#17b.  $\int 2x(x^2 - 9)^3 dx$

#18b.  $\int \frac{x^3}{\sqrt{1+x^4}} dx$

#19b.  $\int e^{3x} \sec(e^{3x}) \tan(e^{3x}) dx$

#20b.  $\int e^{\ln(5x+3)} dx$

#### 4.5 day 2 – Extra Practice

Evaluate the definite integral.

$$\#3b. \int_0^1 x\sqrt{1-x^2} \, dx$$

$$\#4b. \int_0^4 \frac{1}{\sqrt{2x+1}} \, dx$$

$$\#5b. \int_0^{\sqrt{2}} xe^{\left(\frac{-x^2}{2}\right)} \, dx$$

$$\#6b. \int_1^5 \frac{x}{\sqrt{2x-1}} \, dx$$

#### 4.6 – Extra Practice

Evaluate the integral.

$$\#7b. \int \frac{5x^3 - 2x}{\sqrt[3]{x^2}} dx$$

$$\#8b. \int \frac{x-3}{\sqrt{4-3x^2}} dx$$

$$\#9b. \int 3x^4 \cot(4x^5 + 1) dx$$

$$\#10b. \int (\cot^2(5x) + 1) dx$$

$$\#11b. \int \frac{1}{x^2 + 4x + 11} dx$$

$$\#12b. \int \frac{1}{x^2 + 4x + 3} dx$$

$$\#13b. \int \frac{3x^2 - 2x + 3}{x^2 + 1} dx$$

$$\#14b. \int \frac{6}{3e^{-x} + 5} dx$$

**4.7 day 1 – Extra Practice**

Evaluate the integral.

#7b.  $\int 4xe^{2x} dx$

#8b.  $\int 3x^2 \ln(x) dx$

#9b.  $\int 7 \ln(3x) dx$

#10b.  $\int x^2 \sin(6x) dx$

$$\#11b. \int t^2 \ln(t+1) dt$$

#### 4.7 day 2 – Extra Practice

Evaluate the integral.

$$\#5b. \int e^{-3x} \sin(5x) dx$$

$$\#6b. \int x^3 e^{-2x} dx$$

$$\#7b. \int x^4 \cos(x) dx$$

#8 (hints):

$$\text{for a) if } u = x^2, dv = \frac{x}{\sqrt{4+x^2}} dx$$

The answers for parts a and b will look different:

$$\text{a) } x^2 \sqrt{4+x^2} - \frac{2}{3} (4+x^2)^{3/2} + C$$

$$\text{b) } \frac{1}{3} (4+x^2)^{3/2} - 4(4+x^2)^{1/2} + C$$

...but if you graph these in a calculator, they are the same curve :)



#### 4.8 – Extra Practice

Evaluate:

$$\#10b. \int \sin^5 x \cos^2 x \, dx$$

$$\#11b. \int \sin^5(3x) \cos(3x) \, dx$$

$$\#12b. \int \sin^2(9x) \, dx$$

$$\#13b. \int 7 \csc(3x) \, dx$$

$$\#14b. \int \cot^3(2x) \csc^3(2x) dx$$

$$\#15b. \int 2 \frac{\tan^2(3x)}{\sec(3x)} dx$$

$$\#16b. \int \sec^4(7x) dx$$

#### 4.9 – Extra Practice

Evaluate the integral.

$$\#5b. \int \frac{4}{x^2 \sqrt{16-x^2}} dx$$

$$\#6b. \int \frac{x^3}{\sqrt{x^2-25}} dx$$

$$\#7b. \int \frac{x^2}{(1+x^2)^2} dx$$

$$\#8b. \int \sqrt{4-9x^2} dx$$

#### 4.10 – Extra Practice

Evaluate the integral.

$$\#8b. \int \frac{2}{9x^2 - 1} dx$$

$$\#9b. \int \frac{3-x}{3x^2 - 2x - 1} dx$$

$$\#10b. \int \frac{4x^2 + 3x + 1}{x^3 + 2x^2 - 3x} dx$$

#### 4.11 – Extra Practice

Evaluate the integral or state that it diverges.

$$\#7b. \int_3^4 \frac{1}{(x-3)^{3/2}} dx$$

$$\#8b. \int_{-\infty}^0 e^{3x} dx$$

$$\#9b. \int_1^{\infty} \frac{6}{x^4} dx$$

$$\#10b. \int_0^{\infty} e^{\left(\frac{1}{3}x\right)} dx$$