

NAME: \_\_\_\_\_ Period: \_\_\_\_\_

SHEET # 501 NO CALCULATOR

DERIVATIVES & INTEGRALS = ANALYTICAL (ALGEBRAIC) METHODS

1.  $\frac{d}{dx} \cos 3x =$

1. \_\_\_\_\_

2.  $\frac{d}{dx} e^{x^2} =$

2. \_\_\_\_\_

3.  $\frac{d}{dx} \tan(x) =$

3. \_\_\_\_\_

4.  $\int x^7 dx =$

4. \_\_\_\_\_

5.  $\int (1/x) dx =$

5. \_\_\_\_\_

6.  $\int \cos(2x) dx =$

6. \_\_\_\_\_

7.  $\int \sin(2x) dx =$

7. \_\_\_\_\_

8.  $\int (\sin x)^{12} \cdot \cos x dx =$   
TRY  $u = \sin x$ .

8. \_\_\_\_\_

9.  $2 \int (x^2 + 1)^{12} \cdot x dx =$

9. \_\_\_\_\_

10.  $\int \frac{(\ln x)^2}{x} dx$

TRY  $u = \ln x$

10. \_\_\_\_\_

$$\int f(u) du = \int f(u) \frac{du}{dx} \cdot dx = \int f(u) \cdot u'(x) dx \quad (u\text{-substitution})$$