

Exam 1 Review Practice Problem Set

Solve by substitution

1)  $\int \frac{3x^2 + 9}{x^3 + 9x + 1} dx =$

2)  $\int (x + 2)e^{(x^2 + 4x)} dx =$

3)  $\int \frac{\tan \theta}{\cos \theta} d\theta =$

4) If  $f(t) > 0$  for all  $t$ ,  $\int_a^b \frac{f'(t)}{f(t)} dt = \ln(f(b))$  then  $f(a) =$

Integrate by Parts

$$5) \int \sin^2(2x) \cos^3(2x) dx =$$

$$6) \int e^{3x} \sin(2x) dx =$$

Partial Fraction and Trig. Identities

$$7) \int \frac{1}{(x+2)^2(x+3)} dx =$$

$$8) \int \frac{1}{t\sqrt{9-t^2}} dt =$$

### Imaginary Numbers

Change from the form  $x + yi$  to  $re^{\theta i}$  or vice versa.

$$9) 3 + 2i$$

$$11) 4e^{\frac{\pi}{3}i}$$

$$10) 1 + i$$

$$12) 4e^{\pi i}$$

$$13) \text{ If } \int_0^1 f(t)dt = 16, \text{ what is } \int_0^{1/4} f(4x)dx ?$$