

### MA 2320: Quiz 4

Name: \_\_\_\_\_

1.  $\int x^2 e^{3x} dx$
2.  $\int x^2 e^{3x^2} dx$ . Try  $u = x$  and  $dv = x e^{3x^2}$ .
3.  $\int x^2 e^{3x^3} dx$
4.  $\int \ln^2(x) dx$
5.  $\int \sin^2(3x) dx$
6.  $\int \sin^3(4x) \cos^3(4x) dx$
7.  $\int \frac{1}{9x^2 - 1} dx$
8.  $\int \frac{1}{\sqrt{x^2 + 1}} dx$
9.  $\int \frac{x^2}{\sqrt{9 - x^2}} dx$  Hint use  $\sin(2\theta) = 2 \sin(\theta) \cos(\theta)$
10.  $\int \frac{x^2 + 4}{x^3 - x} dx$
11.  $\int \frac{3x + 4}{x^3 + x} dx$
12.  $\int \frac{x^3}{x^2 - 1} dx$
13.  $\int_0^\infty \frac{1}{1 + x^2} dx$
14.  $\int_1^\infty \frac{1}{x^2} dx$
15.  $\int_0^1 \frac{1}{x^2} dx$
16. When does  $\int_1^\infty \frac{1}{x^p} dx$  converge or diverge? That is, for what values of  $p$  does the integral converge or diverge?
17.  $\int_1^\infty \frac{x^2 + 4}{x^3 - x} dx$ . See Problem 10
18.  $\int_1^\infty \frac{3x + 4}{x^3 + x} dx$ . See Problem 11