Name: Date:

Worksheet 4, Math 10560

Times indicate the amount of time that you would be expected to spend on the problem in on an exam. All problems have appeared on old exams for Calculus 2.

1. (4 mins) Evaluate the integral $\int_1^2 x^3 \ln x \, dx$.

2. (4 mins) Evaluate the integral
$$\int x \sin(3x) \, dx.$$

3. (8 mins partial credit) Calculate the integral
$$\int \sqrt{9 - x^2} \, dx \ .$$

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4. (4 mins.) Evaluate the integral

$$\int_0^{\pi/2} \sin^5(x)\cos^3(x)dx \ .$$

5. (8 mins partial credit) Calculate the integral

$$\int_0^3 \frac{1}{\sqrt{x^2+9}}\, dx \ .$$

6. (4 mins) Compute $\int_0^{\pi/2} \sin(7x)\ \sin(3x)\ dx$

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The following is the formula sheet included with exam 1:

$$\sin^2 x + \cos^2 x = 1$$

$$1 + \tan^2 x = \sec^2 x$$

$$\sin^2 x = \frac{1}{2}(1 - \cos 2x)$$

$$\cos^2 x = \frac{1}{2}(1 + \cos 2x)$$

$$\sin 2x = 2 \sin x \cos x$$

$$\sin x \cos y = \frac{1}{2}\big(\sin(x - y) + \sin(x + y)\big)$$

$$\sin x \sin y = \frac{1}{2}\big(\cos(x - y) - \cos(x + y)\big)$$

$$\cos x \cos y = \frac{1}{2}\big(\cos(x - y) + \cos(x + y)\big)$$

$$\int \sec \theta = \ln|\sec \theta + \tan \theta| + C$$