Exam 1

Show all work to receive credit. Access to internet / graphing calculator / etc during the exam will result in a score of 0.

1.

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

2.

$$\int \frac{2x+1}{(x-2)(x-6)}\,dx =$$

3.

$$\int x^3 \sin^2(x^4)\,dx =$$

4.

$$\int \tan^3 \theta \sec^3 \theta \, d\theta =$$

5.

$$\int x^3 \sqrt{x^2 + 4} \, dx =$$

6. (you need to do at least three of the following; additional ones may be done for extra credit.)

Evaluate at least three of the following integrals:

(a)

$$\int 2x \tan^{-1} x \, dx =$$

(c)

$$\int \frac{\sqrt{x^2 - 9}}{x^4} \, dx =$$

(d)

$$\int e^{3x} \sin 4x \, dx =$$

(e)

$$\int \frac{x^2}{\sqrt{16 - x^2}} \, dx =$$

(f)

$$\int \frac{x^2 + 4x + 6}{x(x^2 + 2x + 1)} \, dx =$$

Scratch work

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

$$\cos 2x = \cos^2 x - \sin^2 x$$

$$\cos^2 \theta = \left(\frac{1}{2}\right)(1 + \cos 2\theta)$$

$$\sin^2 \theta = \left(\frac{1}{2}\right)(1 - \cos 2\theta)$$

$$\sin A \cos B = \frac{1}{2}\sin(A - B) + \frac{1}{2}\sin(A + B)$$

$$\sin A \sin B = \frac{1}{2}\cos(A - B) - \frac{1}{2}\cos(A + B)$$

$$\cos A \cos B = \frac{1}{2}\cos(A - B) + \frac{1}{2}\cos(A + B)$$