

Math 125 D Winter 2012
Mid-Term Exam Number Two
February 23, 2012
Answers

There were two versions of the exam.

Version A: The first integral has an $x + 3$ in it.

1. (a) $\frac{2}{\sqrt{3}} \tan^{-1} \left(\frac{\sqrt{x}}{\sqrt{3}} \right) + C$ (b) $\frac{5}{29} e^{2x} \sin 5x + \frac{2}{29} e^{2x} \cos 5x + C$
2. (a) $2 \sin^{-1} \frac{x+1}{2} + \frac{1}{2}(x+1)\sqrt{4-(x+1)^2} + C$ (b) $\frac{1}{8} \sin^8 x - \frac{1}{5} \sin^{10} x + \frac{1}{12} \sin^{12}(x) + C$
3. (a) $4 \ln |x+2| - 3 \ln |x+1| - \frac{1}{x+1} + C$ (b) $\ln 2$
4. $\frac{2}{35} \pi$
5. $\frac{3875\pi}{6}$
6. 1.30517967

Version B: The first integral has a $\sin 4x$ in it.

1. (a) $-\frac{4}{25} e^{3x} \cos 4x + \frac{3}{25} e^{3x} \sin 4x + C$ (b) $\frac{2}{\sqrt{5}} \tan^{-1} \left(\frac{\sqrt{x}}{\sqrt{5}} \right) + C$
2. (a) $\frac{9}{2} \sin^{-1} \left(\frac{x-1}{3} \right) + \frac{1}{2}(x-1)\sqrt{9-(x-1)^2} + C$ (b) $-\frac{1}{10} \cos^{10} x + \frac{1}{12} \cos^{12} x + C$
3. (a) $\frac{1}{16} \ln |x+1| + \frac{15}{16} \ln |x-3| - \frac{9}{4} \frac{1}{x-3} + C$ (b) $\frac{\ln 5}{4}$
4. $\frac{2\pi}{9}$
5. 72π
6. 0.4584951