

Math 125 G - Winter 2011  
Mid-Term Exam Number Two  
February 24, 2011  
Answers

There were two versions.

Version A - Problem 1 (a) has an integrand with  $\sin^3 x$  in it

1. (a)  $-\frac{1}{25} \cos^{25} x + \frac{1}{27} \cos^{27} x + C$  (b)  $\frac{5}{41} e^{4x} \sin 5x + \frac{4}{41} e^{4x} \cos 5x + C$

2. (a)  $\frac{3}{2}x^2 + 2x + 4 \ln |x| - 4 \ln |x - 1| + C$  (b)  $\frac{x}{\sqrt{1-x^2}} + C$

3. (a)  $\ln |x - 3| - \frac{3}{x - 3} + C$  (b)  $2\sqrt{x} \ln x - 4\sqrt{x} + C$

4. (a)  $\frac{1}{7}(\ln 13 - \ln 6)$  (b)  $\frac{\pi}{8}$

5. work =  $(1050)(9.8) \int_0^2 (2.5 - y)\pi(e^y)^2 dy$

6. (a) arc length =  $\int_0^{\pi/2} \sqrt{1 + \sin^2 x} dx$   
(b) 1.9101

Version B - Problem 1 (a) has an integrand with  $\cos^3 x$  in it

1. (a)  $\frac{1}{19} \sin^1 9x - \frac{1}{21} \sin^2 1x + C$  (b)  $-\frac{7}{53} e^{2x} \cos 7x + \frac{2}{53} e^{2x} \sin 7x + C$

2. (a)  $\frac{1}{2}x^2 + 3x - \ln |x| + \ln |x - 1| + C$  (b)  $\frac{x}{\sqrt{1-x^2}} + C$

3. (a)  $\ln |x + 5| + \frac{5}{x + 5} + C$  (b)  $2\sqrt{x} \ln x - 4\sqrt{x} + C$

4. (a)  $\frac{\ln 2}{7}$  (b)  $\frac{\pi}{12}$

5. work =  $(1050)(9.8) \int_0^3 (4.2 - y)\pi(e^y)^2 dy$

6. (a) arclength =  $\int_0^{\pi/2} \sqrt{1 + \cos^2 x} dx$   
(b) 1.9101