

Exam 2      Math 112      October 19, 2006  
Answers

1.  $W = \int_0^{500} \left( 150 + 8000 - \frac{8 \cdot 15 \cdot 25}{500} x \right) dx$

2.  $L = 2 \int_{-3}^3 \sqrt{\frac{y^2}{9(9-y^2)} + 1} dy = 2 \int_{-1}^1 \sqrt{1 + \frac{9x^2}{1-x^2}} dx$

3. a)  $f(x) = x + 1 + \frac{A}{x-3} + \frac{B}{x+2}$

b)  $f(x) = \frac{A}{x-1} + \frac{B}{(x-1)^2}$

c)  $f(x) = \frac{A}{x+2} + \frac{Bx+C}{(x+2)^2+1}$

4.  $I = \frac{3}{40} (2x^2 + 4)^{\frac{5}{3}} - \frac{3}{2} (2x^2 + 4)^{\frac{2}{3}} + C$

5.  $I = \sqrt{3} \frac{\pi}{6} - \frac{\pi}{4} + \frac{1}{2} (\ln(4) - \ln(2))$

6.  $I = 2 \sin^{\frac{1}{2}} x - \frac{4}{5} \sin^{\frac{5}{2}} x + \frac{2}{9} \sin^{\frac{9}{2}} x + C$

7.  $I = \sqrt{x^2 + 8x + 9} - 4 \ln |x + 4 + \sqrt{x^2 + 8x + 9}| + C$

8.  $I = \frac{x}{2} (\cos(\ln x) + \sin(\ln x)) + C$

9.  $I = \frac{1}{2} \ln |x^2 + 4x + 5| + 3 \arctan(x + 2) + C$

10.  $T_8 = \frac{1}{2} \left( \frac{0}{2} + 3.2 + 10.1 + 17.0 + 25.3 + 31.0 + 37.0 + 42.1 + \frac{46.7}{2} \right)$   
 $S_8 = \frac{1/2}{3} (0 + 4(3.2) + 2(10.1) + 4(17.0) + 2(25.3) + 4(31.0) + 2(37.0) + 4(42.1) + 46.7)$

11.  $E_T \leq \frac{4^3 \cdot 3}{12 \cdot 4^2}$