

Answers

Winter 2011 Math 125 Final Exam

1. (a)  $(x^2 - 25) \ln(x + 5) - \frac{1}{2}x^2 + 5x + C$   
(b)  $\frac{1}{80} (9 + 4x^2)^{5/2} - \frac{3}{16} (9 + 4x^2)^{3/2} + C$
2. (a)  $\ln\left(\frac{2}{3}\right) + \frac{2}{3}$   
(b)  $\frac{\pi}{6} - \frac{3\sqrt{3}}{2} + 3$
3. (a)  $\pi \tan^{-1}(B)$   
(b) Yes,  $\frac{\pi^2}{2}$   
(c)  $2\pi (\sqrt{1 + B^2} - 1)$   
(d) No
4. (a) 16 m  
(b) 4 m/sec  
(c) 2.26 sec
5. 191,560 joules
6. (a)  $\int_0^1 2\pi y g(y) dy$   
(b) 4.87
7.  $\bar{x} = \frac{\pi^2 - 4}{2\pi}$ ,  $\bar{y} = -\frac{1}{4}$
8.  $y = \frac{2}{1 + x^2}$
9. (a)  $\frac{dP}{dt} = \frac{1}{10}P - 3600$   
(b)  $P(t) = 36,000 + (P_0 - 36,000)e^{t/10}$   
(c) \$12,130.80  
(d) \$11,868.48