

Fall 2005 Math 152

Exam 2 Review Exercises - Solutions

Review Exercises: Sections 8.4 - 9.6

1. $\frac{1}{3} \ln \frac{8}{5}$
2. $-\ln|x| + \frac{1}{x} + \ln|x-1| + C$
3. $3 \ln|x-1| + \ln|x^2+1| - \tan^{-1}x + C$
4. $\frac{x^2}{2} + x + \ln|x-1| + C$
5. $M_4 = e^{9/16} + e^{1/16}$
6. $T_5 = 6.02$
7. a.) $S_4 = \frac{1}{12}(4 \ln(1.25) + 2 \ln(1.5) + 4 \ln(1.75) + \ln(2))$
 b.) $|E_s| \leq \frac{1}{7680}$
 c.) $n = 8$
8. a.) Converges to $\frac{1}{2}$
 b.) Diverges
 c.) Diverges
9. a.) Converges, with comparison function $\frac{1}{x^4}$
 b.) Diverges, with comparison function $\frac{1}{\sqrt{x}}$
 c.) Diverges, with comparison function $\frac{1}{x}$
10. $y = x^4 - x^2$
11. $y = \pm \sqrt{\ln|\frac{2}{3}x^3 + C|}$
12. $y = \ln|\ln \frac{1+e^x}{1+e} + 1|$
13. $y = e^{-x^2}(\frac{1}{2}x^2 + C)$
14. $\sqrt[3]{3}$
15. $y = 4e^{5x-35}$
16. $15e^{-.25}$ kg
17. $\frac{\pi}{2}$
18. $\frac{2}{3}(5\sqrt{5} - 1)$
19. $\frac{\pi}{6}(17\sqrt{17} - 1)$
20. x axis revolution:
 $\int_0^1 2\pi x^4 \sqrt{1+16x^6} dx$
 y axis revolution:
 $\int_0^1 2\pi x \sqrt{1+16x^6} dx$
21. $\int_0^{\frac{\pi}{2}} 2\pi \cos x \sqrt{1+\sin^2 x} dx, \int_0^1 2\pi y \sqrt{1+\frac{1}{1-y^2}} dy$
22. $9\pi(2 - \sqrt{2})$
23. .25
24. $M_x = -15, M_y = 55$, centroid: $(5, -\frac{15}{11})$
25. $M_x = \frac{1021}{5}, M_y = 81$, centroid: $(\frac{45}{26}, \frac{1021}{234})$
26. $(\frac{\pi\sqrt{2}-4}{4(\sqrt{2}-1)}, \frac{1}{4(\sqrt{2}-1)})$
27. a.) 8,996,400N
 b.) 674,730N
 c.) $\frac{501760}{3}$
28. a.) 1125 lbs
 b.) 421.875 lbs
29. a.) 705,600N
 b.) 744,800N