

Math 1B

Midterm 3 Review Answers

All answers in the tables are rounded to 2 decimal places. For the midterm, you will need to find exact answers (using fractions, radicals, logarithms, trigonometry, e and/or π as needed). For maximum effectiveness, you should create all the integrals associated with one region, find them to check for correctness against the answers below, fix your errors, then move on to the next region. After you have done this for all regions, you should randomly select some of the integrals you created (at least one per region and type (shell/washer)), perform the manual integration, check and correct.

Work together as much as possible to discuss possible errors. (If everyone independently gets the same incorrect answer, let me know immediately.)

| | | VOLUME OF SOLID IF REGION IS REVOLVED AROUND | | | | | |
|--------|-------|--|----------|----------|----------|---------|---------|
| REGION | AREA | $x = -3$ | $x = 5$ | $y = -1$ | $y = 10$ | | |
| P | 4.50 | 155.51 | 70.69 | 237.50 | 73.51 | | |
| Q | 10.67 | 201.06 | 335.10 | 281.49 | 455.74 | | |
| REGION | AREA | $x = 0$ | $x = -2$ | $x = 3$ | $y = -1$ | $y = 2$ | $y = 3$ |
| R | 1.50 | 3.14 | 21.99 | 25.13 | 12.57 | 15.71 | 25.13 |
| S | 4.50 | | 73.51 | 67.86 | 42.41 | 42.41 | 70.69 |
| T | 0.39 | 0.59 | 5.45 | 6.69 | 6.43 | 0.86 | 3.28 |
| U | 3.44 | 20.07 | 63.26 | 44.71 | 46.73 | 18.05 | 39.64 |

| VOLUME IF REGION IS BASE OF SOLID AND CROSS SECTIONS PERPENDICULAR TO X-AXIS ARE | | | |
|--|---------|-------------|-----------------------|
| REGION | SQUARES | SEMICIRCLES | EQUILATERAL TRIANGLES |
| P | 8.10 | 3.18 | 3.51 |
| Q | 34.13 | 13.40 | 14.78 |
| R | 3.00 | 1.18 | 1.30 |
| T | 0.27 | 0.11 | 0.12 |

- [1] $\frac{34}{3}$

[2] 24

[3] $\frac{33}{16}$

[4] $\frac{16e^4 - 15e^2 - 1}{16e^2}$
- [5] $\frac{15}{2}$

[6] 6

[7] 9.417237485

[8] 17.1910031
- [9] [a] [i] 133826.8205 ft-lb

[9] [a] [ii] 79459.67467 ft-lb

[9] [a] [b] 54367.14583 ft-lb
- [10] [a] 1960.3538161 lb

[10] [b] 1021.776908 lb

[10] [c] 644.8 lb

[10] [d] 665.6 lb
- [11] [a] $\frac{5}{4}$

[11] [b] $\frac{5}{16}$

[11] [c] $\frac{5 \ln 5}{4}$

[11] [d] $\frac{5}{3}$
- [12] [a] $\frac{3}{124}$

[12] [b] $\frac{14}{31}$

[12] [c] $\frac{117}{31}$

[12] [d] $\sqrt[3]{63}$