

The test is over sections 6.1 - 6.3 and 7.1 - 7.3. Topics include,

1. Areas between curves and Volumes by cross sectional area, slicing, and shells.
2. Integration Techniques: integration by parts, integration using trigonometric identities and trigonometric substitutions.

As usual reviewing your lecture notes, quizzes, and homework should be helpful in preparing for the test. Suggested review problems from Chapter 6, p 446 are: Concept Check: 1, 3, Exercises: 1, 7, 9, 13, 19, 25.

Suggested review problems from Chapter 7, p 518 are: Concept Check : 1, 3, Exercises: Odds, 5-13, 17,21.

Homework Problems from which homework quizzes will be taken after the test follow:

- Section 7.4 (page 481) (possible HW quiz questions) 1,5,9,11,19,25,29,31
 Section 7.4 (page 481) (additional problems) 3,7,13,17,21,27,35,39
 Section 7.7 (page 505) (possible HW quiz questions) 3,5,17,21
 Section 7.7 (page 505) (additional problems) 7,15,19,29
 Section 7.8 (page 515) (possible HW quiz questions) 5,9,13,17,21,27,49,57
 Section 7.8 (page 515) (additional problems) 11,15,19,23,31,35,51,53,59
 Section 11.1 (page 684) (possible HW quiz questions) 5,9,17,23,39,33,39.61.
 Section 11.1 (page 684) (additional problems) 7,13,19,25,29,35,37,63.
 Section 11.2 (page 694) (possible HW quiz questions) 3,7,11,15,17,23,31,37.
 Section 11.2 (page 694) (additional problems) 1,9,13,21,25,39,47.
 Section 11.3 (page 703) (possible HW quiz questions) 5,7,13,17,21,27.
 Section 11.3 (page 703) (additional problems) 3,9,15,19,25,29.
 Section 11.4 (page 709) (possible HW quiz questions) 5,9,11,17,21,27,33.
 Section 11.4 (page 709) (additional problems) 3,7,13,15,19,23,29,35.
 Section 11.5 (page 713) (possible HW quiz questions) 5,7,13,17,19,23,27.
 Section 11.5 (page 713) (additional problems) 3,9,15,21,25,29.
 Section 11.6 (page 719) (possible HW quiz questions) 1,3,7,13,21,23,27.
 Section 11.6 (page 719) (additional problems) 5,9,15,19,25,29.
 Section 11.7 (page 722) (possible HW quiz questions) 3,9,13,21,25,31,35.
 Section 11.7 (page 722) (additional problems) 5,11,15,17,23,29,33.
 Section 11.8 (page 727) (possible HW quiz questions) 5,9,15,19,23,27.
 Section 11.8 (page 727) (additional problems) 3,11,17,21,25.
 Section 11.9 (page 733) (possible HW quiz questions) 5,9,13 (a),15,23,27.
 Section 11.9 (page 733) (additional problems) 3,11,17,21,25,31.
 Section 11.10 (page 746) (possible HW quiz questions) 7,9,13,19,25,33,45.49,55,65.
 Section 11.10 (page 746) (additional problems) 5,11,17,35,47,51,57,63.

Here are two practice tests quite similar to Test 1.

Practice Test 1

Given $2 \cos^2 x = 1 + \cos 2x$, $2 \sin^2 x = 1 - \cos 2x$. $\sin 2x = 2 \sin x \cos x$. You may also use any other trigonometric identities and/or integration formulas 1-14, 17,18, on page 484 provided you have memorized these formulas.

25 pts 1. (a) Sketch the region bounded by the graph of $y = \cos x$, $y = 1 - \cos x$, and lines, $x = 0, \pi$.
(b) Find the area of this region.

30 pts 2. (a) Set up the integral for the volume of the solid of revolution obtained from rotating the region R bounded by the graph of $y = \sec x$, the x axis, the y axis, and the line $x = \pi/4$ about the x axis.

(b) Set up the integral for the volume obtained from rotating R (as defined in (a)) about the y axis.
(c) Find one of the integrals you wrote in (a), (b).

45 points 3. Use the integration methods discussed in class to find the following integrals.

(a) $\int \arccos(2x) dx.$

(b) $\int \sin^2 5x dx$

(c) $\int_{\sqrt{2}}^2 \frac{1}{x^3 \sqrt{x^2 - 1}} dx.$

Answers Practice Test 1

1. (a) Can graph in class or recitation if asked.

(b) $2\sqrt{3} + \pi/3.$

2. (a) By slices, $V = \pi \int_0^{\pi/4} \sec^2 x dx.$

(b) By shells, $V = 2\pi \int_0^{\pi/4} x \sec x dx.$

(c) $V = \pi$ in 2 (a).

3. (a) $x \arccos(2x) - (1/2)(1 - 4x^2)^{1/2} + c.$

(b) $x/2 - \sin(10x)/20 + c$

(c) $\pi/24 + \sqrt{3}/8 - 1/4.$

Practice Test 2

Given $2 \cos^2 x = 1 + \cos 2x$, $2 \sin^2 x = 1 - \cos 2x$. $\sin 2x = 2 \sin x \cos x$. You may also use any other trigonometric identities and/or integration formulas 1-14, 17,18, on page 484 provided you have memorized these formulas.

25 pts 1. (a) Sketch the region R bounded by the graph of the parabola $x = y^2$ and the line connecting the points $(1,1)$, $(1/4, -1/2)$.

(b) Find the area of R .

25 pts 2. Find the volume of the solid obtained from rotating the region R in problem 1 about the y axis. You may use either of the methods discussed in class, slices or shells.

50 pts 3. Use the integration techniques discussed in class to find the following integrals:

(a) $\int_0^1 \sqrt{4-x^2} dx$

(b) $\int \tan^3(4x) \sec(4x) dx.$

(c) $\int x \cos x dx.$

10 pts EC. A right circular cone of radius r and height h has its vertex at the origin and axis along the x axis. Use the method of cross sections to find the volume of this cone.

Answers Practice Test 2

1. (a) Can sketch in class or recitation if asked.

(b) $9/16$.

2. $9\pi/20$.

3. (a) $\pi/3 + \sqrt{3}/2$.

(b) $(1/12) \sec^3(4x) - (1/4) \sec(4x) + c.$

(c) $x \sin x + \cos x + c.$

EC. $V = (1/3)\pi r^2 h.$