

**MATH 2043 EXAM 2 REVIEW
FOR DISRIBUTION**

TEXT: Hass, Weir, Thomas, *University Calculus*, Pearson Education, Inc., 2007

SECTION 12.4: 5, 10, 12

SECTION 12.5: 6, 11, 18, 21

SECTION 12.6: 3, 6, 7, 8

SECTION 12.7: 12, 20, 21, 23, 25, 29, 30

SECTION 12.8: 3, 4, 5, 10, 11, 17 (Also in problem 17 show that if $P_0(X_0, Y_0, Z_0)$ is the point found and Q is the point $Q(1, 1, 1)$, then $\overrightarrow{P_0Q}$ is normal to the plane $x + 2y + 3z = 13$)

SECTION 13.1: 7, 9, 10, 15, 19, 20

SECTION 13.2: 5, 6, 21, 25, 27, 28, 31

SECTION 13.3: 3, 5, 7, 8

SECTION 13.4: 9, 10, 11, 13, 15, 37, 39

SECTION 13.5: 5 (evaluate one way), 9, 11, 17, 27, 28, 30, 32

SECTION 13.7: 4, 5, 8, 11 (a& b), 31, 37, 53

Convert to cylindrical coordinates and evaluate

1. $\int_{-2}^2 \int_0^{\sqrt{4-x^2}} \int_0^{\sqrt{4-x^2-y^2}} z \sqrt{x^2 + y^2 + z^2} \, dz dy dx$

2. $\int_{-2}^0 \int_{-\sqrt{4-x^2}}^0 \int_{-\sqrt{4-x^2-y^2}}^{\sqrt{4-x^2-y^2}} z \sqrt{x^2 + y^2 + z^2} \, dz dy dx$

3. Evaluate $\int \int \int_{\mathbf{D}} e^{-(x^2+y^2+z^2)^{3/2}} \, dV$ where \mathbf{D} is the region that lies below the sphere $x^2 + y^2 + z^2 = 4$ and above $z = \sqrt{x^2 + y^2}$.

Review Exercises Chapter 13 — 17, 18, 19, 20, 31

Also, Set up integrals in rectangular, cylindrical and spherical coordinates to find the volume of the region bounded below by the cone $z = \sqrt{x^2 + y^2}$ and above by the sphere $x^2 + y^2 + z^2 = 8$ and evaluate one of the three integrals.