

MA 261

REVIEW PROBLEMS FOR EXAM 2

Exam 2 will cover Lessons 14-25.

P. 975: 27, 29, 34(a), 35, 37, 39, 42, 45, 46, 47, 48, 52, 56, 60, 61.

P. 1050: 5, 8, 13, 17, 24, 26, 36(b), 38, 39, 41, 47.

Answers to Even Numbered Problems

P. 975

34. (a) $dA = 0.017$.

$$42. \frac{\partial z}{\partial x} = \frac{2xz^3 - yze^{xyz}}{xye^{xyz} - 4yz^3 - 3x^2z^2}, \quad \frac{\partial z}{\partial y} = \frac{z^4 - xze^{xyz}}{xye^{xyz} - 4yz^3 - 3x^2z^2}.$$

$$46. \frac{25}{6}$$

48. $\nabla f(0, 1, 2) = 2\mathbf{i} + \mathbf{k}$ is the direction of most rapid increase. The rate of increase in that direction is $|\nabla f(0, 1, 2)| = |2\mathbf{i} + \mathbf{k}| = \sqrt{5}$.

52. $(0, 0)$ is a saddle point. $(1, \frac{1}{2})$ is a local minimum.

56. The absolute maximum of f on D is $f(0, \pm 1) = 2e^{-1}$ and the absolute minimum is $f(0, 0) = 0$.

60. The absolute maximum is $f(\sqrt{2}, \sqrt{2}) = \sqrt{2}$ and the absolute minimum is $f(-\sqrt{2}, -\sqrt{2}) = -\sqrt{2}$.

P. 1050

8. $\frac{1}{4}.$

24. $\frac{1}{1080}.$

26. $\frac{13}{24}$

36. (b) $m = \frac{a^5}{15}.$ $M_x = \frac{a^6}{24}.$ $M_y = \frac{\pi a^6}{96}.$ $(\bar{x}, \bar{y}) = \left(\frac{5\pi a}{32}, \frac{5a}{8} \right).$

38. $\frac{3\pi}{a^2} \sqrt{a^2 + 1}.$