

Partial Answer Key to Review Guide Test 2 Practice Questions

1. $\{ (x, y) \mid 4x^2 + y^2 \leq 32 \}$; $2\sqrt{6}$
 2. Parabolas: $\{ (x, y) \mid y - x^2 = e^c \}$
 3. Show by taking limits along two different paths – see examples in book, exercises, Maple lab.
 4. c
 5. See text
 6. See text, notes
 7. See text
 8. Approx 11.06 cubic cm.
 9. $2s + 2t - 6(t - s)^2$
 10. 182 cubic feet per minute
 11. a) $\langle 1/3, -2/3 \rangle$
b) $11/15$
c) $\langle 1/3, -2/3 \rangle$
d) $\frac{\sqrt{5}}{3}$
e) $\langle -1/3, 2/3 \rangle$
 12. F (It is normal to the level curves)
 13. a) $6(x - 1) - 3(y - 2) + 6(z - 3) = 0$ or $2x - y + 2z = 18$ (or any scalar multiple of)
b) $x = 6t + 1$; $y = -3t + 2$; $z = 6t + 3$
 14. $x = 4t + 2$; $y = -3t + 3$; $z = -2t + 13$
 15. $f_x(x, y) = 2x - 3y + 1$ $f_y(x, y) = -3x + 3y^2$
 $f_{xx}(x, y) = 2$ $f_{yy}(x, y) = 6y$
 $f_{xy}(x, y) = -3$
- Critical points $(1/4, 1/2)$ -- saddle point
 $(1, 1)$ -- relative min

16. At (20 tables,30 chairs) have a maximum of 8000 in revenue.