Partial Answer Key to Review Guide Test 2 Practice Questions

1. c)

2. See text

3. See text

4. See text

5. Approx 11.06 cubic cm.

6. $2s + 2t - 6(t - s)^2$

7. 182 cubic feet per minute

8. a) <1/3, -2/3>
   b) 11/15
   c) <1/3, -2/3>
   d) $\sqrt{5}/3$
   e) <-1/3, 2/3>

9. F (It is normal to the level curves)

10. $6(x-1)-3(y-2)+6(z-3)=0$ or $2x-y+2z=18$ (or any scalar multiple of)

11. $4(x-2)-3(y-3)-2(z-13)=0$ or $4x-3y-2z=-27$ (or any scalar multiple of)

12. $f_x(x,y) = 2x-3y+1$ $\quad$ $f_y(x,y) = -3x+3y^2$
    $f_{xx}(x,y) = 2$ $\quad$ $f_{yy}(x,y) = 6y$
    $f_{xy}(x,y) = -3$

    Critical points (1/4, 1/2) -- saddle point
    (1, 1) -- relative min

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