Math 40 **Name (Print):** _____

Exam 5: Chapter 5-11/7/13

Write all responses on separate paper. Remember to organize your work clearly. You may *not* use your books, notes, or any calculator on this exam.

1. (16 points) Consider the quadratic equation $y = 10x^2 + 21x - 13$
   (a) Specify the values of the coefficients, a, b and c.
   (b) Compute the value of the discriminant in the quadratic formula.
   (c) Use the quadratic formula to find the x-intercepts of the parabola.
   (d) What is the x-coordinate of the vertex?

2. (12 points) Graph each parabola. Give the coordinates of the vertex and intercepts in each.

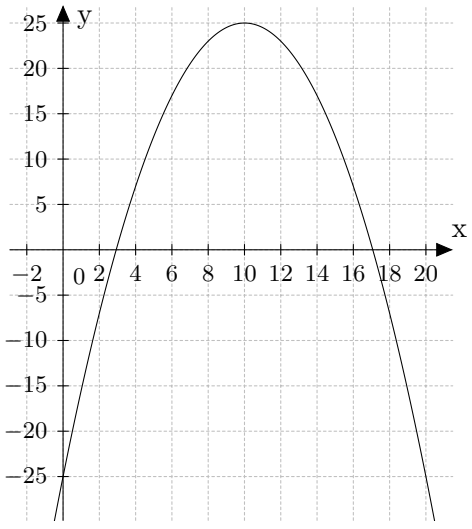
   (a) $y = (x-3)^2$ (b) $y = -\frac{2}{3}(x-3)^2$ (c) $y = 2 - \frac{2}{3}(x-3)^2$

3. (15 points) Find coefficients a, b and c for the parabola $y = ax^2 + bx + c$ that fits the points in the table:

x	-2	1	2
y	13	4	9

4. (12 points) A child throws her doll up out a window. The doll starts at a height of 8 meters above the ground and reaches a maximum height of 9 meters when it's 1 meter from the house.
   (a) Write an equation for the height of the doll in terms of its distance from the house.
   (b) How far from the house will the doll hit the ground?

5. (15 points) Consider the parabola whose graph is shown at right.
   (a) Find the coordinates of the vertex.
   (b) Find the vertex form for the equation of the parabola.
   (c) Find the x-intercepts of the parabola.



6. (15 points) Consider the parabola described by $y = -2(x+3)(x-7)$
   (a) What are the x-intercepts of the parabola?
   (b) What are the coordinates of the vertex?
   (c) Solve the inequality $-2(x+3)(x-7) \geq 0$. Write the solution in interval notation.

7. (15 points) Solve each inequality and write the solutions in interval notation.

   (a) $(x-1)(x+2) > 0$ (b) $(x-3)^2 - 16 \leq 0$ (c) $10x^2 + 21x - 13 \leq 0$