**Applications of Inequalities /20**

**1.** (4 points) The length of a rectangle, *l* metres, is greater than or equal to 1 m less than twice the width, *w* metres.

**a)** Write an inequality to describe the situation.

**b)** What are the restrictions on the length and width?

**c)** Graph *l* versus *w* for the inequality.

**d)** List three possible sets of dimensions for the rectangle.



**2.** (3 points) A groundskeeper is asked to plant flowers in a bed in front of an office building. During a sale at the garden store, a flat of marigolds costs $8 and a flat of petunias costs $9. The store is paying the taxes as part of the sale. The groundskeeper can spend at most $120.

**a)** What inequality models this situation?

**b)** Graph the inequality and discuss the restrictions on the variables.



**3.** (4 points) Rondell makes $10/h cutting grass and $12/h raking leaves. He cannot work more than 15 h per week. How many hours per week does he have to work at each job if he wants to earn at least $120 per week? Let *c* represent the number of hours he works cutting grass and *r* the number of hours raking leaves. Show all inequalities.



**4.** (3 points) Julia wants to plant a garden and surround it with decorative stones. She has enough stones to enclose a rectangular garden with a perimeter of 68 ft, but she wants the garden to cover no more than 240 ft2. What could the width of her garden be?

**5.** (3 points) A baseball player hits a high pop-up with an initial upward velocity of 30 m/s, 1.4 m above the ground. The height, *h*, in metres, of the ball *t* seconds after being hit is modelled by the function . How long does a player on the opposing team have to get under the ball if she catches it 1.4 m above the ground? Display your answer on a number line.

**6.** (3 points) Suppose the height, *h*, in feet, of a trampolinist above the ground during one bounce is modelled by the quadratic function . For what period of time is the trampolinist at least 22 ft above the ground? Round your answers to the nearest hundredth.