Math 135: Intermediate Algebra Worksheet 7 November 15, 2007

- 1. An architect is designing a building. She wants a rectangular room to have an area of 400 square feet. (Hint: you can find the area of a rectangle by multiplying its length by its width.)
 - (a) First considers making the room square. How long are the walls in this case?
 - (b) Next she decides that the room should be four times as long as it is wide. What are the length and width of the room?
 - (c) Instead decides to make the room's length 9 feet greater than its width. What are the dimensions of the room now?
 - (d) Of the three choices above, which option for the shape of the room makes the perimeter the smallest? Which the largest?
- 2. Towards the end of a car race, car 1 is 60 meters behind car 2. Car 1 moves at a constant speed of 20 meters per second. Car 2 has just come out of the pit. It starts from zero speed and accelerates at a constant rate of 10 meters per second per second.
 - (a) Write an algebraic expression for the distance car 1 has travelled after t seconds.
 - (b) After t seconds, car 2 has travelled $5t^2$ meters. Write an algebraic expression for the distance between car 1 and car 2 after t seconds. (Hint: try drawing a picture of the situation.)
 - (c) At what time does car 2 pass car 1?
- 3. A bus company charges a fare of \$40 per person plus \$2 for every empty seat on the bus. A bus has 40 seats on it. Let x be the number of riders on the bus.
 - (a) Write an expression in terms of x for how much each rider pays.
 - (b) Write an expression in terms of x for how much money the bus company collects in total.
 - (c) Suppose it costs the bus company \$1000 to run the bus regardless of how many passengers there are. What is the minimum number of passengers there must be for the bus company to make a profit?
 - (d) Suppose it costs the bus company \$1750 to run the bus regardless of how many passengers there are. What is the *maximum* number of passengers there can be for the bus company to make a profit?
- 4. The product of two consecutive even integers is 224. Find the integers.