# Math 135: Intermediate Algebra <br> Worksheet 7 <br> 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 $5 t^{2}$ 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.
