

Math 34A — Week 2

28.

- (a) A highway patrolman traveling at the speed limit is passed by a car going 15 mph faster than the speed limit. After one minute, the patrolman speeds up to 100 mph. How long after speeding up until the patrolman catches up with the speeding car. The speed limit is 55 mph.
- (b) Same question, but this time the patrolman speeds up to a speed of v mph ($v > 70$).

25.

- (a) A right-angled triangle has a 45° angle. If the area is 2 cm^2 , what is the length of the perimeter?
- (b) Same question, but this time the area is $A \text{ cm}^2$.

62. The radius of the Earth is about 4,000 miles. One rope is laid on the ground all the way around the equator. A second rope is placed exactly 5 feet above the first rope all the way around the equator. How much longer is the second rope in feet?

47. An airplane departs from LA and flies to NY every 30 minutes. The trip takes 5 hours and 5 minutes. An airplane takes off from NY at the same time that one takes off from LA and flies to LA at the same speed. How many planes does it pass going in the opposite direction?

19. There are more than $1/4$ million species of beetle. Assume the average length of a beetle is 1 cm and the average walking speed is 10 cm per second. These beetles walk up a gang-plank that is 5 meters long onto an ark. They do this in pairs, side by side, one male and one female from each species. The pairs of beetles are spaced 2 cm apart. How many hours will it take for $1/4$ million species of beetles to embark onto the ark once the first pair starts up the gangplank?

51. An airline sells all the tickets for a certain route at the same price. If it charges 200 dollars per ticket it sells 10,000 tickets. For every 15 dollars the ticket price is reduced, an extra thousand tickets are sold. Thus if the tickets are sold for 185 dollars each then 11,000 tickets sell. It costs the airline 100 dollars to fly a person.

- (a) Express the total profit P in terms of the number n of tickets sold.
- (b) Express the total profit P in terms of the price p of one ticket.