

Averaging Slopes

It is 210 miles from Chicago to Ann Arbor. Frank doesn't want to pay a toll so he takes the side roads for the first 70 miles to Benton Harbor. On this part of the trip he averages 30 miles per hour. Then he gets on I-94 and averages 60 mph on the 70 mile stretch from Benton Harbor to Battle Creek. How fast must he travel on the remaining distance to Ann Arbor to average 60 mph for the trip.

Do you need to know the length of the three segments of the trip to solve this problem?

Finding the 'average' slope

Homework due September 7.

1. Fritz skis for three hours at 2km/hr then for 3 hours at 6 km/hr. What is his average speed? Graph the (piecewise linear) actual trip that Fritz made. Then graph the trip if the entire trip had been made at the average speed. Graph distance against time.

2. Fritz skis for three km at 2km/hr then for 3 km at 6 km/hr. What is his average speed? Graph the (piecewise linear) actual trip that Fritz made. Then graph the trip if the entire trip had been made at the average speed. Graph distance against time.

3. Write a formula for the average speed if a vehicle travels the same time at speed A and at speed B.

4. Write a formula for the average speed if a vehicle travels the same distance at speed A and at speed B. Interpret this formula in terms of the slopes of the graphs in problems 2 and 3.

5. Marie skis for 2 hours at 2km per hour then for 4 hours at 6 km/hr. What is her average speed?

6. Marie skis for 2 km at 2km per hour then for 4 km at 6 km/hr. What is her average speed?

7. Write a formula for the average speed if a person skis for x hours at A km per hour and then for y hours at B km per hour.

8. Write a formula for the average speed if a person skis for x km at A km per hour and then for y km at B km per hour.

9. Draw a graph for problem 2 interpreting distance as the independent variable and time as the dependent variable. Find the slope of the entire trip. Compare the slopes of the graphs in problems 2 and in this one. Explain the relationship between these slopes using the formulas from problems 3 and 4.