5 AUTOMOBILE OWNERSHIP

5-1 Classified Ads
5-2 Buy or Sell a Car
5-3 Graph Frequency Distributions
5-4 Automobile Insurance
5-5 Linear Automobile Depreciation

Slide 1

5 AUTOMOBILE OWNERSHIP

5-6 Historical and Exponential Depreciation
5-7 Driving Data
5-8 Driving Safety Data
5-9 Accident Investigation Data

Slide 2

5-1

CLASSIFIED ADS

OBJECTIVES

Compute the cost of classified ads for used cars.
Compute the cost of sales tax on automobiles.

Slide 3

Key Terms

- sales tax
- domain
- piecewise function
- split function
- cusp
How do buyers and sellers use classified ads for automobiles?

- What are common car options that might be listed in a classified ad?
- What are their abbreviations?

Example 1
Kerry purchased a used car for $7,400 and had to pay 8½% sales tax. How much tax did she pay?

Example 2
The cost of a classified ad is determined by its length. John plans to sell his car and places a 5-line ad. The newspaper charges $31 for the first two lines and $6 per extra line to run the ad for one week. What will John’s ad cost to run for two weeks?

CHECK YOUR UNDERSTANDING
The sales tax rate in Mary Ann’s state is 4%. If she purchases a car for x dollars, express the total cost of the car with sales tax algebraically.
CHECK YOUR UNDERSTANDING
Ramon plans to sell his car and places an ad with $x$ lines. The newspaper charges $y$ dollars for the first $g$ lines and $p$ dollars per extra line to run the ad for a week. If $x > g$, express the cost of running the ad for a week.

CHECK YOUR UNDERSTANDING
The *Smithtown News* charges $38 for a classified ad that is 4 or fewer lines long. Each line above four lines costs an additional $6.25. Express the cost of an ad as a piecewise function.

EXAMPLE 3
Jason works for the *Glen Oaks News* and is writing a program to compute ad costs. He needs to enter an algebraic representation of the costs of an ad. His company charges $42.50 for up to five lines for a classified ad. Each additional line costs $7. Express the cost of an ad with $x$ lines as a function of $x$ algebraically.

Example 4
Roxanne set up the following piecewise function which represents the cost of an auto classified from her hometown newspaper.

$$c(x) = \begin{cases} 
41.55 & \text{when } x \leq 6 \\
41.55 + 5.50(x - 6) & \text{when } x > 6 
\end{cases}$$

If $x$ is the number of lines in the ad, use words to express the price $c(x)$ of a classified ad from this paper.
CHECK YOUR UNDERSTANDING

The following piecewise function gives the price \( p(w) \) of a classified ad in a classic car magazine. If \( w \) is the number of lines in the ad, use words to express the price \( p(w) \) of a classified ad from this paper.

\[
p(w) = \begin{cases} 
60 & \text{when } w \leq 5 \\ 
60 + 8(w - 5) & \text{when } w > 5 
\end{cases}
\]

EXAMPLE 5

Graph the piecewise function Roxanne created in Example 4.

CHECK YOUR UNDERSTANDING

Find the cusp of the graph of the following piecewise function.

\[
c(x) = \begin{cases} 
42.50 & \text{when } x \leq 5 \\ 
42.50 + 7(x - 5) & \text{when } x > 5 
\end{cases}
\]

OBJECTIVES

5-2

BUY OR SELL A CAR

Compute mean, median, mode, range, quartiles, and interquartile range.
Key Terms

- statistics
- data
- measures of central tendency
- mean
- arithmetic average
- outlier
- median
- ascending order
- descending order
- skew
- resistant
- range
- quartiles
- lower quartile
- upper quartile
- subscripts
- interquartile range (IQR)
- mode
- bimodal

How can statistics help you negotiate the sale or purchase of a car?

- What is more important to you, the mechanical condition of the car or its appearance?
  - Why?
- Do you think the appearance is a reflection of the mechanical condition of the car?

Example 1

Jason wants to sell his Ford SUV. He compiles these prices from the Internet for cars similar to his: $11,000, $9,900, $12,100, $10,500, and $9,000. What is a reasonable price for Jason to consider for his SUV?

CHECK YOUR UNDERSTANDING

Maxine compiled a list of these car prices: $7,500, $6,500, $5,750, $4,900, $6,250, and $4,200. Find the mean of the prices.
Example 2

Dory is looking for a classic 1967 Firebird. She finds these prices on the Internet: $18,000, $77,000, $22,000, $21,200, $19,000, $17,500, and $22,500. She computes the mean as $28,171.43. This number doesn’t seem to be a good representative of the data. How can she find a better representation?

CHECK YOUR UNDERSTANDING

Find the mean and median of the following prices for a used car extended warranty: $1,200, $1,650, $1,500, $2,000, $1,400, $1,850, and $1,600. Is the data skewed?

EXAMPLE 3

Find the median of the following used car prices: $6,700, $5,800, $9,100, $8,650, $7,700, and $7,800.

CHECK YOUR UNDERSTANDING

Find the median of these prices: $10,200, $9,300, $11,900, $2,999, $17,200, and $9,600.
EXAMPLE 4

Prices found online for the same GPS navigation system are $295, $345, $199, $225, and $200. Find the range of the GPS prices.

CHECK YOUR UNDERSTANDING

Find the range of the used car prices in Example 3.

EXAMPLE 5

Find the quartiles for the tire pressures of cars at an auto clinic.

15, 17, 21, 25, 31, 32, 32, 34

Tire pressure is measured in psi—pounds per square inch.

CHECK YOUR UNDERSTANDING

What percent of the numbers in a data set are above Q₃?
Example 6
What is the difference between $Q_1$ and $Q_3$ from the data set in Example 5?

Example 7
Find the outliers for these tire prices: $45, 88, 109, 129, 146, 189, 202, 218,$ and $545$

CHECK YOUR UNDERSTANDING
Find the interquartile range for the data in Example 3.

CHECK YOUR UNDERSTANDING
The store that charged $545 for a tire in Example 7 had a sale and lowered its price to $399. Is the new price an upper outlier?
Example 8
Each year, the 880 seniors in North Shore High School vote for one of the 110 teachers to receive the annual yearbook dedication. The teacher who receives the most votes wins. Can a teacher who receives 9 votes win, if every senior votes?

CHECK YOUR UNDERSTANDING
Find the mode of the tire pressures from Example 5.

5-3
GRAPH FREQUENCY DISTRIBUTIONS

OBJECTIVES
Create a frequency distribution from a set of data.
Use box-and-whisker plots and stem-and-leaf plots to display information.
Use linear regression to negotiate the purchase or sale of a used car.

Key Terms
- frequency distribution
- frequency
- stem-and-leaf plot
- box-and-whisker plot
- boxplot
- modified boxplot
Why are graphs used so frequently in mathematics, and in daily life?

- Can graphs be used to mislead people?

Example 1
Jerry wants to purchase a car stereo. He found 33 ads for the stereo he wants and arranged the prices in ascending order:

$540 $550 $550 $550 $600 $600 $600 $675 $700 $700 $700 $700 $700 $700 $750 $775 $775 $800 $870 $900 $900 $990 $990 $990 $990 $990 $1,000 $1,200 $1,200 $1,200

He is analyzing the prices, but having trouble because there are so many numbers. How can he organize his prices in a helpful format?

CHECK YOUR UNDERSTANDING

Use the frequency distribution from Example 1 to find the number of car stereos selling for less than $800.

Example 2
Find the mean of the car stereos prices from Example 1.
CHECK YOUR UNDERSTANDING
Jerry, from Example 1, decides he is not interested in any of the car stereos priced below $650 because they are in poor condition and need too much work. Find the mean of the data set that remains after those prices are removed.

EXAMPLE 3
Rod was doing Internet research on the number of gasoline price changes per year in gas stations in his county. He found the following graph, called a stem-and-leaf plot. What are the mean and the median of this distribution?

```
    1 | 1 1 2 3 7 9
    2 | 0 3 6 6
    3 | 8 8 9 9 9 9 9
    4 | 0
    5 | 2 2 4 5 5 5 6 7
    6 | 3 4 4
    7 | 2
```

CHECK YOUR UNDERSTANDING
Find the range and the upper and lower quartiles for the stem-and-leaf plot shown in Example 3.

EXAMPLE 4
Rod, from Example 3, found another graph called a box-and-whisker plot, or boxplot. It is shown below.

Find the interquartile range of distribution.
**CHECK YOUR UNDERSTANDING**

Based on the box-and-whisker plot from Example 4, what percent of the gas stations had 55 or fewer price changes?

**EXAMPLE 5**

The following box-and-whisker plot gives the purchase prices of the cars of 114 seniors at West High School. Are any of the car prices outliers?

The following box-and-whisker plot gives the purchase prices of the cars of 114 seniors at West High School. Are any of the car prices outliers?

**CHECK YOUR UNDERSTANDING**

Examine the modified boxplot. Is 400 an outlier?

**5-4 AUTOMOBILE INSURANCE**

Learn about different types of auto insurance coverage.

Compute insurance costs.

Compute payments on insurance claims.
**Key Terms**

- liable
- negligent
- automobile insurance
- premium
- claim
- liability insurance
- bodily injury liability (BI)
- property damage liability (PI)
- uninsured/underinsured motorist protection (UMP)
- personal injury protection (PIP)
- no-fault insurance
- comprehensive insurance
- collision insurance
- car-rental insurance
- emergency road service insurance
- actuary
- surcharge
- deductible

**Why is having auto insurance so important?**

- What types of damages could you cause while driving?
- Do you know how much auto body work costs?
- Do you know how much a fire hydrant or lamp post costs?
- What do you know about the cost of doctors and hospitals?

**Example 1**

Kwan’s annual premium is $1,284. If he pays quarterly, there is a $1 per payment surcharge (extra fee). What is the quarterly payment?

**CHECK YOUR UNDERSTANDING**

Leon’s annual premium is $x dollars. If he pays his premium semiannually, there is a y-dollar surcharge on each semiannual payment. Express the amount of his semiannual payment algebraically.
Example 2
Stan DeMille has $25,000 worth of property damage liability insurance. He caused an accident that damaged a $2,000 fire hydrant and did $5,600 worth of damage to another car. How much of the damage must Stan pay?

CHECK YOUR UNDERSTANDING
Keith ran his car into a telephone pole that had a bicycle leaning against it which was also damaged. The pole will cost $x dollars to fix, the bicycle will cost $y dollars to replace, and there was $w dollars damage to the car. Express algebraically the amount that can be claimed under Keith's property damage liability insurance.

Example 3
Peter has $1,000 deductible collision insurance. Peter backs his car into his garage and causes $4,300 worth of damage to the car. How much will his insurance company have to pay?

CHECK YOUR UNDERSTANDING
Manuel has an $x-dollar deductible on his comprehensive insurance. His car is stolen and never recovered. The value of his car is $y dollars where $y > x$. How much must the insurance company pay him for his stolen car?
EXAMPLE 4
Bob was in an auto accident caused by his negligence. He has 100/300 bodily injury insurance. The three people injured in the accident sued. One person was awarded $140,000, and each of the other two was awarded $75,000. How much does the insurance company pay?

EXAMPLE 5
Desmond has a policy with 50/150 BI, $50,000 PD, and $50,000 PIP. He causes an accident in which he hurts 7 people in a minivan and 4 people in his own car, including himself. The eleven people who are hurt have minor injuries and do not sue Desmond. The total medical bill for all involved is $53,233. How much does the insurance company pay?

CHECK YOUR UNDERSTANDING
Joan has 50/100 BI liability insurance. She hurts 28 children riding a school bus, and each child is awarded $10,000 as a result of a lawsuit. How much will the insurance company pay in total for this lawsuit?

CHECK YOUR UNDERSTANDING
Pat has 50/100 BI liability insurance and $100,000 PIP insurance. She hurts 28 children in a school bus and is not sued. However, if each child needs $10,000 for medical care, how much will the insurance company pay in total for these medical claims?
2-5
LINEAR AUTOMOBILE DEPRECIATION

OBJECTIVES

Write, interpret, and graph a straight line depreciation equation.
Interpret the graph of a straight line depreciation.

Key Terms
- depreciate
- appreciate
- straight line depreciation
- slope
- straight line depreciation equation

What is the value of your car?

- How do the automobile industry, car dealers, and individual owners define “car value”?
- What makes a car valuable to you?
- What factors might contribute to the monetary value of a car?
- Name some items that would appreciate or depreciate over time.

Example 1

Suppose that you purchase a car for $27,000. According to your online research, this make and model of car loses all of its marketable value after 12 years. That is, it depreciates to a value of zero dollars 12 years after the purchase date. If this car depreciates in a straight line form, what are the intercepts of the depreciation equation?
CHECK YOUR UNDERSTANDING
A car sells for $D$ dollars and totally depreciates after $T$ years. If this car straight line depreciates, what are the intercepts of the straight line depreciation equation?

Example 2
Determine the slope of the straight line depreciation equation for the situation in Example 1.

CHECK YOUR UNDERSTANDING
Write the slope of the straight line depreciation equation that models the situation in which a car is purchased for $D$ dollars and totally depreciates after $T$ years.

EXAMPLE 3
Write the straight line depreciation equation for the situation discussed in Examples 1 and 2. Then draw the graph of the equation.
CHECK YOUR UNDERSTANDING
Write and graph the straight line depreciation equation for a car that was purchased for $22,000 and totally depreciates after 11 years.

CHECK YOUR UNDERSTANDING
A car sells for $18,495 dollars and straight line depreciates to zero after 9 years. Write the straight line depreciation equation for this car and an expression for the value of the car after \( W \) months.

EXAMPLE 4
Suppose that Jack purchased a car five years ago at a price of $27,600. According to research on this make and model, similar cars have straight line depreciated to zero value after 12 years. How much will this car be worth after 66 months?

EXAMPLE 5
The straight line depreciation equation for a car is \( y = -4,000x + 32,000 \). In approximately how many years will the car's value decrease by 25%?
CHECK YOUR UNDERSTANDING
Write an algebraic expression that represents the length of time it will take the car in Example 5 to have a value of $D$ dollars.

CHECK YOUR UNDERSTANDING
How might the expense function be altered so that it reflects a more accurate amount spent over time? What effect might that have on the graphs?

EXAMPLE 6
Celine bought a new car for $33,600. She made a $4,000 down payment and pays $560 each month for 5 years to pay off her loan. She knows from her research that the make and model of the car she purchased straight line depreciates to zero over 10 years.

a. Create an expense and depreciation function.
b. Graph these functions on the same axes.
c. Interpret the region before, at, and after the intersection point.

OBJECTIVES

5-6 HISTORICAL AND EXPONENTIAL DEPRECIATION
Write, interpret, and graph an exponential depreciation equation.
Manipulate the exponential depreciation equation in order to determine time, original price, and depreciated value.
Key Terms

- dollar value
- historical data
- historical depreciation
- exponential decay
- exponential depreciation

How does your car lose its value?

- What does devaluation mean?
  - What does it mean for a car?
  - What factors might contribute to a car losing its value?

Example 1

Determine an exponential depreciation equation that models the data in the table from the previous page.
CHECK YOUR UNDERSTANDING

How might a better-fitting exponential depreciation equation look when superimposed over the same scatterplot?

Example 2

What is the depreciation percentage for the 10 years of car prices as modeled by the exponential depreciation equation found in Example 1?

CHECK YOUR UNDERSTANDING

After entering a set of automobile value data into a graphing calculator, the following exponential regression equation information is given: $y = a \cdot b^x$, $a = 32,567.98722$, $b = 0.875378566$. Round the values to the nearest hundredth. Determine the depreciation percentage.

EXAMPLE 3

Eamon purchased a four-year-old car for $16,400. When the car was new, it sold for $23,000. Find the depreciation rate to the nearest tenth of a percent.
CHECK YOUR UNDERSTANDING
A car originally sells for $D$ dollars. After $A$ years, the value of the car has dropped exponentially to $P$ dollars. Write an algebraic expression for the exponential depreciation rate expressed as a decimal.

EXAMPLE 4
A car originally sold for $26,600. It depreciates exponentially at a rate of 5.5% per year. When purchasing the car, Richard put $6,000 down and pays $400 per month to pay off the balance. After how many years will his car value equal the amount he paid to date for the car?

CHECK YOUR UNDERSTANDING
Describe the situation pictured above after 4 years.

EXAMPLE 5
A car exponentially depreciates at a rate of 6% per year. Beth purchased a 5-year-old car for $18,000. What was the original price of the car when it was new?
CHECK YOUR UNDERSTANDING
A car depreciates exponentially at a rate of 5% per year. If the car is worth $30,000 after 9 months, what was the original price of the car?

EXAMPLE 6
Leah and Josh bought a used car valued at $20,000. When this car was new, it sold for $24,000. If the car depreciates exponentially at a rate of 8% per year, approximately how old is the car?

CHECK YOUR UNDERSTANDING
How old would the car in Example 4 be had it been purchased at half its value?

5-7
DRIVING DATA
OBJECTIVES
Write, interpret, and use the distance formula.
Use the formula for the relationship between distance, fuel economy, and gas usage.
Key Terms
- odometer
- electronic odometer
- mechanical odometer
- trip odometer
- speedometer
- fuel economy measurement
- miles per gallon (mpg)
- kilometers per liter (km/L)
- English Standard System
- Metric System
- distance formula
- currency exchange rate

What data is important to a driver?
- Which is a greater distance—a mile or a kilometer?
- If a sign read “100 miles to the Canadian Border”, would the numeral used to represent the number of kilometers be greater than 100 or less than 100?

Example 1
A car travels at an average rate of speed of 50 miles per hour for 6 hours. How far does this car travel?

CHECK YOUR UNDERSTANDING
A car is traveling at $R$ miles per hour for $M$ minutes. Write an algebraic expression for the distance traveled.
**Example 2**

Jack lives in New York and will be attending college in Atlanta, Georgia. The driving distance between the two cities is 883 miles. Jack knows that the speed limit varies on the roads he will travel from 50 mi/h to 65 mi/h. He figures that he will average about 60 mi/h on his trip. At this average rate, for how long will he be driving? Express your answer rounded to the nearest tenth of an hour and to the nearest minute.

**CHECK YOUR UNDERSTANDING**

Danielle drove from Atlanta, Georgia, and Denver, Colorado, which is a distance of 1,401 miles. If she averaged 58 miles per hour on her trip, how long is her driving time to the nearest minute?

**Example 3**

Kate left Albany, New York, and traveled to Montreal, Quebec. The distance from Albany to the Canadian border is approximately 176 miles. The distance from the Canadian border to Montreal, Quebec, is approximately 65 kilometers. If the entire trip took her about 3 hours, what was her average speed for the trip?

**CHECK YOUR UNDERSTANDING**

In Example 3 above, could Kate’s km/h have been calculated by multiplying her miles per hour by the conversion factor? Explain your answer.
EXAMPLE 4
Juan has a hybrid car that averages 40 miles per gallon. His car has a 12-gallon tank. How far can he travel on one full tank of gas?

CHECK YOUR UNDERSTANDING
Lily drove a total of 500 miles on \( g \) gallons of gas. Express her fuel economy measurement in miles per gallon as an algebraic expression.

EXAMPLE 5
When Barbara uses her car for business, she must keep accurate records so that she will be reimbursed for her car expenses. When she started her trip, the odometer read 23,787.8. When she ended the trip it read 24,108.6. Barbara’s car gets 32 miles per gallon. Her tank was full at the beginning of the trip. When she filled the tank, it cost her $40.10. What price did she pay per gallon of gas on this fill-up?

CHECK YOUR UNDERSTANDING
Suppose a person begins a trip with an odometer reading of \( A \) miles and ends the trip with an odometer reading of \( B \) miles. If the car gets \( C \) miles per gallon and the fill-up of gas for this trip cost \( D \) dollars, write an algebraic expression that represents the price per gallon.
Example 6
David is driving in Mexico on his vacation. He notices that gas costs 8.50 Mexican pesos per liter. What is this equivalent to in U.S. dollars?

Example 7
David knows that the price of gas in his home town is about $2.90 per gallon. How can he compare this price to the price paid in Example 6 for a liter?

CHECK YOUR UNDERSTANDING
On a trip through Canada, Angie noticed that the average price of gas per liter was 1.28 Canadian dollars. If 1 USD is equivalent to approximately 1.07 Canadian dollars, what is the equivalent gas price per gallon in U.S. currency?

CHECK YOUR UNDERSTANDING
In the Example 6 Check Your Understanding, Angie knew that the price of gas in her home town was $2.50 per gallon. What is the equivalent price in Canadian dollars per liter?
5-8
DRIVING SAFETY DATA

OBJECTIVES

- Calculate reaction time and distance in the English Standard System.
- Calculate and use the braking distance in both the English Standard and Metric Systems.
- Calculate and use the total stopping distance in both the English Standard and Metric Systems.

How can you use mathematics to become a safer driver?

- How long do you think it takes a driver to react to something in the roadway that requires the car to stop?
- When a driver applies the brakes to a car
  - How long does it take the car to stop?
  - What distance does the car travel before it stops?

Key Terms

- reaction time
- thinking time
- reaction distance
- braking distance
- total stopping distance

Example 1

What is the reaction distance for a car traveling approximately 48 miles per hour?
CHECK YOUR UNDERSTANDING
A car is traveling at 65 mi/h. Approximately how far will it travel during the average reaction time?

Example 2
What is the approximate braking distance for a car traveling at 48 mi/h?

CHECK YOUR UNDERSTANDING
What factors also need to be taken into account that might add to or subtract from the braking distance?

EXAMPLE 3
Rachel is driving at 48 mi/h on a one-lane highway. She sees an accident directly ahead of her about 200 feet away. Will she be able to stop in time?
CHECK YOUR UNDERSTANDING
What is the total stopping distance for a car traveling at 65 mi/h?

CHECK YOUR UNDERSTANDING
A car is traveling at 78 km/h. What is the total stopping distance in meters? Round your answer to the nearest hundredth of a meter.

EXAMPLE 4
Desireé is traveling through Canada. The speedometer in her rented car indicates kilometers per hour and all of the road signs give distances in kilometers. She knows that one kilometer is equal to 1,000 meters and one meter is a little more than 3 feet. Determine Desireé’s total stopping distance if she is traveling 88 kilometers per hour.

EXTEND YOUR UNDERSTANDING
Toni’s car is traveling 75 km/h. Randy’s car is behind Toni’s car and is traveling 72 km/h. Toni notices a family of ducks crossing the road 50 meters ahead of her. Will she be able to stop before she reaches the ducks? What is the least distance that Randy’s car can be from Toni’s car to avoid hitting her car, if he reacts as soon as he sees her brakes?
5-9
ACCIDENT INVESTIGATION DATA

OBJECTIVES

Determine the minimum skid speed using the skid mark formula.
Determine the minimum skid speed using the yaw mark formula.

Key Terms

- accident reconstructionist
- skid speed formula
- drag factor
- braking efficiency
- skid distance
- chord
- middle ordinate

What data might a car leave behind at the scene of an accident?

- What information might skid marks give an accident reconstructionist?

Example 1

A car is traveling on an asphalt road with a drag factor 0.78. The speed limit on this portion of the road is 35 mi/h. The driver just had his car in the shop and his mechanic informed him that the brakes were operating at 100% efficiency. The driver must make an emergency stop when he sees an obstruction in the road ahead of him. His car leaves four distinct skid marks each 80 feet in length.

What is the minimum speed the car was traveling when it entered the skid? Round your answer to the nearest tenth.

Was the driver exceeding the speed limit when entering the skid?
CHECK YOUR UNDERSTANDING
A portion of road has a drag factor of x. A car with a y percent braking efficiency is approaching a traffic jam ahead, causing the driver to apply the brakes for an immediate stop. The car leaves four distinct skid marks of z feet each. Write an expression for determining the minimum speed of the car when entering into the skid.

Example 2
Melissa was traveling at 50 mi/h on a concrete road with a drag factor of 1.2. Her brakes were working at 90% efficiency. To the nearest tenth of a foot, what would you expect the average length of the skid marks to be if she applied her brakes in order to come to an immediate stop?

CHECK YOUR UNDERSTANDING
Neil is traveling on a road at M miles per hour when he slams his foot on the brake pedal in order to avoid hitting a car up ahead. He is traveling on a gravel road with a drag factor of A and his brakes are operating at 100% efficiency. His car leaves three skid marks of length x, y, and z, respectively. Write an algebraic expression that represents the skid distance.

EXAMPLE 3
An accident reconstructionist took measurements from yaw marks left at a scene. Using a 43-foot length chord, she determined that the middle ordinate measured approximately 4 feet. The drag factor for the road surface was determined to be 0.8. Determine the radius of the curved yaw mark to the nearest tenth of a foot. Determine the minimum speed that the car was going when the skid occurred to the nearest tenth.
CHECK YOUR UNDERSTANDING
Determine the minimum speed of a car at the point the brakes are immediately applied to avoid a collision based upon a yaw mark chord measuring 62.4 feet and a middle ordinate measuring 5 feet. The drag factor of the road surface is 1.2. Round your answer to the nearest tenth.