Calculate the (a) total cost and (b) cost per mile. Check your answers in the back of the book.

1. Winona Perry rents a car for $30.00 a day for 4 days plus $0.22 per mile and does not need CDW. She drives 430 miles and spends $59.90 on gasoline.

2. Wilson Swartz rents a car for 5 days at $51.29 a day and has unlimited miles. Wilson drives 198 miles and spends $29.90 on gasoline. The CDW fee is $15.50 per day.

GRAPHING CALCULATOR LAB

Graphing Functions

You are moving from an apartment to a house and are planning to rent a 24-foot moving truck. You have two options.

Rent-a-Truck charges $39.95 plus $0.79 per mile. Tom's Rentals charges $49.95 plus $0.59 per mile. For what number of miles is the price the same?

Step 1: Write an equation to represent each company.

Rent a Truck: $39.95 + 0.79x$
Tom's Rentals: $49.95 + 0.59x$

Step 2: Enter each equation into the calculator:

Y= 3 9 . 9 5 +

7 9 x,T,θ,n ENTER 4 9 .

9 5 + 5 9 x,T,θ,n
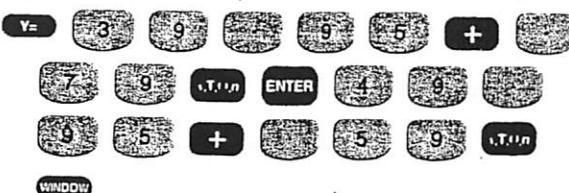
WINDOW

Set the viewing window to [0, 100, 5, 0, 100, 5]

Step 3: Graph each equation: GRAPH

Step 4: To determine the number of miles when the price is the same, find the point of intersection. Press:

2nd TRACE 5 ENTER ENTER ENTER

Plot1 Plot2 Plot3
\Y1■39.95+.79X
\Y2■49.95+.59X
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=

Intersection
X=50   Y=79.45
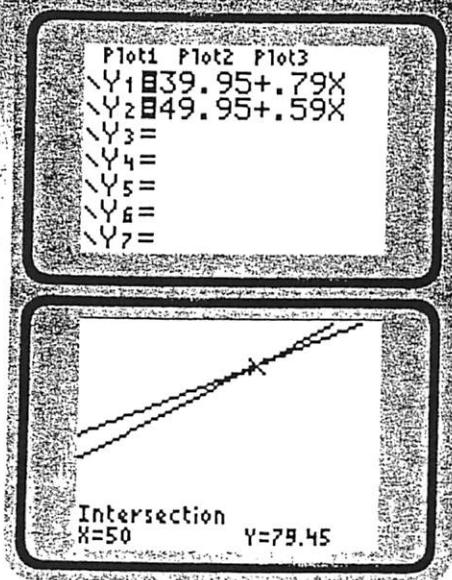
Think and Discuss

1. Describe the display of the first calculator screen.
2. Describe the display of the second calculator screen.
3. For what number of miles is the price the same? What is the cost?
4. Which company is the better deal if you only drive the moving van 40 miles? Explain.
5. For how many miles is Tom's Rentals a better deal for a 16 foot truck? Explain.
   - Rent-a-Truck charges $25.95 plus $0.79 per mile.
   - Tom's Rentals charges $39.95 plus $0.59 per mile.

Renting a Vehicle

Lesson Objective
Calculate the cost to rent a vehicle and the cost per mile to drive a rented vehicle.

Content Vocabulary
- rent

As You Read

Identify Why might you want to rent a vehicle?

GET READY for the Lesson

Would you consider purchasing a hybrid vehicle? Why or why not?

Robin Grady recently rented a hybrid car while on a business trip. She was very pleased with its operation and is thinking about purchasing one.

Renting a Vehicle From time to time, you may need to **rent** a vehicle, which means to use a vehicle by agreeing to pay a set fee. Some vehicle rental agencies charge a daily rate **plus** a per-mile rate. Others charge a daily rate with no mileage fee. In either case, you pay for the gasoline used.

You might also have to pay a collision damage waiver (CDW) fee on a rented vehicle. It requires you to pay a fee so that the rental company waives its right to recover from you losses for any physical damage that you cause. Use this formula to determine how much you are paying to rent per mile:

$$\text{Cost per Mile} = \frac{\text{Total Cost}}{\text{Number of Miles}}$$

EXAMPLE

Joe Wozniak rented a standard SUV in Cleveland for 3 days at $49.95 per day plus $0.20 per mile. He purchased the collision waiver for $24.99 per day. Joe drove 468 miles and paid $66.70 for gasoline. What is the: **(a)** total cost to rent the SUV, **(b)** cost per mile to rent the SUV?

Step 1: Find the total cost.

Daily cost + Mileage cost + Collision waiver + Gasoline cost

($49.95 × 3) + ($0.20 × 468) + ($24.99 × 3) + $66.70

= $149.85 + $93.60 + $74.97 + $66.70 = $385.12
total cost

Step 2: Find the cost per mile.

$$\text{Cost per Mile} = \frac{\text{Total Cost}}{\text{Number of Miles}} = \frac{\$385.12}{468} = \$0.8229 = \$0.82$$

49.95 **×** 3 **=** 149.85 **M+** .20 **×** 468 **=** 93.6
M+ 24.99 **×** 3 **=** 74.97 **M+** **RM** 318.42 **+** 66.70
= 385.12 **÷** 468 **=** .822905983
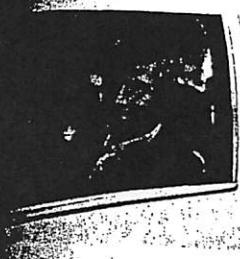
8. Kirk Ryder agreed to a deposit of $475 and 48 payments of $475 to lease a luxury car. He paid the $65 title fee and $85 license fee.

9. Suzi Doohan leased an SUV by making a $2,295.00 deposit and agreeing to 39 payments of $421.38. She also paid the $160.00 title fee and $271.00 license fee.

10. Teneshia Clayton has an open-end lease for an SUV that she uses for her fabric store. The lease costs $421.38 a month for 48 months. She paid a $2,500.00 deposit, an $85 title fee, and a $235.00 license fee. At the end of the lease, she can buy the vehicle for its $15,446.00 residual value. What is the total (a) to lease and (b) to buy the vehicle?

11. Nikolai Rakov leases a vehicle for $399.00 a month for 48 months. He pays a deposit of $1,225.00, an $85.00 title fee, and a $160.00 license fee. The lease stipulates a $0.20 per mile charge for all miles more than 60,000 driven. If he drives the vehicle 68,515 miles, what is the total cost of leasing the vehicle?

12. CHALLENGE PROBLEM Alicia Hanover can lease a sedan for $454.95 a month for 48 months. She must pay a $250.00 deposit, a $75.00 title fee, and a $120.00 license fee. After 48 months, the sedan will be worth $4,117.00. Alternately, she can purchase the vehicle for $478.96 a month for 48 months plus a $978.00 down payment and the same title and license fees. Is it less expensive to purchase it as described or at the end of the open-end lease?

13. ALGEBRA For its year-end model clearance sale, a new auto dealership is offering a 2-year lease with $1,999.00 due at signing, which includes all taxes, title, and fees. The lessee is responsible for $0.12 per mile more than 12,000 miles driven per year and must have approved credit. If the total lease cost is $6,775.00, how much is the monthly lease payment?

H.O.T. Problems

Spiral Review

Multiply. (Skill 8)

14. 33.190×5 **15.** 29.95×4 **16.** 7×54.65

17. Len and Pat Mayfield are purchasing a swimming pool with an installment loan that has a 12% APR. The pool sells for $1,899.99. The store financing requires a 10% down payment and 12 monthly payments. What is the finance charge? (Lesson 8.3)

18. Stephanie Lamden purchases two dozen binders at $1.79 per binder, 8 packages of pens at $2.49 per package, and 4 packages of highlighters at $3.99 per package in Cleveland, Ohio, where the sales tax rate is 7.5%. What is the total purchase price? (Lesson 6.2)

GET READY for the Next Lesson

PREREQUISITE SKILL Adding Decimals (Skill 5)

Add.

19. $71.25 + 4.33 + 67.5$

20. $132.45 + 51.78 + 96.01 + 182.43$

21. $4.57 + 5.29 + 141.82 + 3.11$

22. $53.4 + 27.68 + 90.06 + 19.97$

Did You Know?

Leasing Popularity According to a recent survey, leases account for 20% of all U.S. vehicles, including 75% of luxury vehicles.

Concept CHECK

Find the total lease cost. Check your answers in the back of the book.

1. Cara Green leased a convertible by making a $3,000.00 deposit and paying $349.00 per month for 36 months, an $80.00 title fee, and a $112.86 license fee.

2. Haru Ito leased a sedan by depositing $1,500.00 and paying $450.00 per month for 39 months, a $145.00 title fee, and a $99.95 license fee.

EXAMPLE 2 Algebra

William Tracey is leasing a midsize four-door sports sedan. The $1,999.00 due at signing includes title and fees. His monthly lease payment is $169.00 plus 6% sales tax. The leasing company allows 10,500 miles per year with a $0.15 per mile overage charge. If the total lease cost is $6,298.36, for how many months does the lease last?

Let n = Number of months the lease will last

$$\text{Total Lease Cost} = \left(\begin{array}{c}\text{Number of} \\ \text{Payments}\end{array} \times \begin{array}{c}\text{Amount of} \\ \text{Payment}\end{array}\right) + \text{Deposit} + \begin{array}{c}\text{Title} \\ \text{Fee}\end{array} + \begin{array}{c}\text{License} \\ \text{Fee}\end{array} + \text{Tax}$$

Multiply and combine like terms ⟶

$6{,}298.36 = n \times [\$169.00 + (\$169.00 \times 6\%)] + \$1{,}999.00$

$\$6{,}298.36 = \$179.14n + \$1{,}999$

Subtract $1,999 from both sides ⟶

$\$4{,}299.36 = \$179.14n$

Divide both sides by ⟶ $179.14

$24 = n$

William's lease is for 24 months.

Concept CHECK

Complete the problem. Check your answer in the back of the book.

3. Dantelle Moss considers leasing a sports coupe with a $4,324.00 deposit due at signing. Each monthly payment is $589.00 plus 7% sales tax. Dantelle would be responsible for $0.30 per mile more than 10,000 miles driven per year. If the total lease cost is $34,575.04, for how many months does the lease run?

Lesson Practice

For Problems 4–9, find the (a) total amount of payments and (b) total lease cost.

	(Number of Payments	×	Amount of Payment	=	Total Amount of Payments)	+	Deposit	+	Title Fee	+	License Fee	=	Total Lease Cost
4.	24	×	$219	=	a. $	+	$1,419	+	$ 80	+	$ 65	=	b. $
5.	48	×	299	=	a.	+	$ 749	+	$ 95	+	$ 28	=	b.
6.	54	×	589	=	a.	+	$1,860	+	120	+	$126	=	b.
7.	60	×	345	=	a.	+	$2,450	+	140	+	$ 98	=	b.

Leasing a Vehicle

Lesson Objective

Calculate the total cost of leasing a vehicle.

Content Vocabulary

- lease
- closed-end lease
- open-end lease

As You Read

Identify How does leasing a vehicle work?

GET READY for the Lesson

Would you consider changing your driving habits to drive fewer miles?

Fizzah Hopkins had become aware of the numerous short trips she made to the grocery, drug, and convenience stores. She decided to plan ahead so that she could make fewer trips and lower her mileage.

Leasing a Vehicle Rather than purchase a vehicle, you might want to lease one. When you **lease** a vehicle, you make monthly payments to the leasing company, the dealer, or the bank for two to five years. You do not own the vehicle but are essentially renting it. At the end of the lease, you may either return the vehicle to the leasing company or purchase it.

The most common lease is a **closed-end lease**, which is a contract that allows you to use a vehicle for a set time period by making a specified number of payments. You return it owing nothing unless it is damaged beyond fair wear and tear or exceeds a mileage limit. If you damage the vehicle or exceed the mileage limit, then you owe money to the leasing company.

Another type of lease is an **open-end lease**. It is also a contract allowing you to use a vehicle for a set time period by making a specified number of payments. At lease end, you can buy it for its residual value. The residual value is the vehicle's expected value at the end of the lease period and is often established at the lease signing. With either the closed-end lease or the open-end lease, you must pay all monthly payments, a security deposit, a title fee, and a **license** fee.

You calculate the total cost of the lease using this formula:

$$\text{Total Lease Cost} = \left(\begin{array}{c}\text{Number of}\\\text{Payments}\end{array} \times \begin{array}{c}\text{Amount of}\\\text{Payment}\end{array}\right) + \text{Deposit} + \begin{array}{c}\text{Title}\\\text{Fee}\end{array} + \begin{array}{c}\text{License}\\\text{Fee}\end{array}$$

EXAMPLE 1

Edwin Reid leases a pickup truck to use in his lawn care business. He pays a $2,000 deposit, $450 per month for 36 months, and an $80 title fee and a $240 license fee. What is his total lease cost?

Find the total lease cost.

$$\left(\begin{array}{c}\text{Number of}\\\text{Payments}\end{array} \times \begin{array}{c}\text{Amount of}\\\text{Payment}\end{array}\right) + \text{Deposit} + \begin{array}{c}\text{Title}\\\text{Fee}\end{array} + \begin{array}{c}\text{License}\\\text{Fee}\end{array} + \begin{array}{c}\text{Tax [when}\\\text{applicable]}\end{array}$$

$$(36 \times \$450) \quad\quad + \$2,000 + \$80 + \$240$$

$$\$16,200 \quad\quad\quad + \$2,000 + \$80 + \$240 = \$18,520 \text{ total lease cost}$$
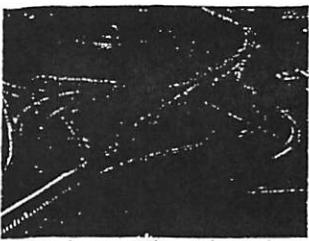
Lesson Practice

For Problems 3–7, determine (a) the total annual cost and (b) the cost per mile to the nearest cent.

Annual Variable Costs		Annual Fixed Costs		Total Annual Cost	Miles Driven	Cost per Mile
3. $1,000.00	+	$1,250.00	=	a. $	6,000	b. $
4. 4,530.00	+	3,750.00	=	a.	15,000	b.

5. Jamar Burr drove 9,500 miles in his car last year. The total of fixed costs was $1,215 and of variable costs was $1,985.

6. Liz Nolan drove 34,500 miles last year. The total of fixed costs was $9,916 and of variable costs was $4,897.

7. Nina Karas purchased a used car 3 years ago for $11,425.00. Its current value is $6,897.00. Annual variable costs this year are gasoline, $2,524.90; oil and filters, $145.21; new battery, $65.45; and transmission repair $981.33. This year insurance cost $1,546.00, registration was $114.95, and loan interest totaled $457.88. Nina drove 19,214 miles this year. Compute the (a) depreciation, (b) annual costs, and (c) cost per mile.

8. Last year Carlito Olmstead drove 142,400 miles in the delivery van that he purchased 2 years ago for $22,565.00. It is now worth $10,320.00. His variable costs this year were gasoline $28,365.21, oil and filters $598.10, 2 sets of tires $897.60, battery $85.95, and maintenance $1,256.54. His insurance cost $2,884.26, registration was $159.65, and loan interest was $658.93. What was the cost per mile for him to operate his van?

9. **CHALLENGE PROBLEM** John Baker is considering two cars. The first is a new four-door, 2.3 liter, 4-cylinder gas engine sedan for $21,735.00. The gas engine sedan gets 21 miles per gallon (mpg) in city driving and 31 in highway driving. The other is a new four-door, 2.3 liter, 4-cylinder gas/electric hybrid sedan for $27,040.00. Its mpg is 33 in city and 34 in highway driving. John drives about 15,000 miles per year equally divided between city driving and highway driving. He decides to buy the hybrid. If he can buy gas for $4.08 per gallon, how long would it take for his gas savings to match the price difference?

H.O.T. Problems

10. **ALGEBRA** Rachel Kauffman drove her SUV 17,600 miles last year. If her cost per mile was $0.47 and her annual variable costs were $48.00 more than her annual fixed costs, find her (a) annual variable costs and (b) annual fixed costs.

Spiral Review

Round to the nearest hundredth. (Skill 2)

11. 21.751   12. 4.3981   13. 0.3179

14. Taylor Hardy deposited $980 for 6 months at 5%. She made no other deposits or withdrawals; (a) how much simple interest did her money earn and (b) what was the amount in the account? (Lesson 5.4)

GET READY for the Next Lesson

PREREQUISITE SKILL Multiplying Decimals (Skill 8)

15. 34.66 × 9   16. 25.19 × 2   17. 56.18 × 4   18. 65.92 × 5

Step 1: Compute the annual depreciation

$$\text{Annual Depreciation} = \frac{\text{Purchase Price} - \text{Today's Value}}{\text{Number of Years Owned}}$$

$$= \frac{\$24,590.00 - \$19,219.00}{2} = \frac{\$5,371.00}{2}$$

$$= \$2,685.50$$

Step 2: Total Variable Costs = $1,576.24 + 71.85 + 154.36 + 322.65 = $2,125.10

Step 3: Total Fixed Costs = $985 + 125.63 + 380.30 + 2,685.50 = $4,176.43

Step 4: Compute the Cost per Mile

$$\text{Cost per Mile} = \frac{\text{Annual Variable Cost} + \text{Annual Fixed Cost}}{\text{Number of Miles}}$$

$$= \frac{\$2,125.10 + \$4,176.43}{14,322.00} = \frac{\$6,301.53}{14,322.00} = \$0.43999$$

$$= \$0.44$$

Concept CHECK

Complete the problem. Check your answer in the back of the book.

1. DeeDee Farrar purchased a new car 3 years ago for $33,500.00. Its current value estimate is $19,900.00. Annual variable costs this year were $995.60. The cost of insurance this year was $2,350.00, registration was $132.50, and loan interest totaled $1,080.00. She drove 13,540 miles this year. Compute the (a) depreciation, (b) annual fixed costs, and (c) cost per mile.

EXAMPLE 2 Algebra

Tiffany East estimates that she will drive 15,000 miles during the year and will have $2,400.00 in annual fixed costs. If her goal is to have a cost per mile of $0.30 or less for her compact car, what is the maximum annual variable cost she can have?

Let x = Annual variable cost

$$\text{Cost per Mile} = \frac{\text{Annual Variable Cost} + \text{Annual Fixed Cost}}{\text{Number of Miles}}$$

$$\$0.30 = \frac{x + \$2,400}{15,000}$$

Multiply both sides by 15,000

$$4,500 = x + \$2,400$$

Subtract $2,400 from both sides

$$\$2,100 = x$$

Tiffany must have annual variable costs of $2,100 or less.

Concept CHECK

Complete the problem. Check your answer in the back of the book.

2. Anwar Mabak incurs $2,818.00 in annual fixed costs to operate his car. He estimates that he will drive 22,500 miles during the year. What are his annual variable costs if his cost per mile is $0.32?

Operating and Maintaining a Vehicle

Lesson Objective
Compute the total cost per mile of operating and maintaining a vehicle.

Content Vocabulary
- variable costs
- fixed costs
- depreciation

As You Read

Summarize
What is the difference between variable and fixed costs?

GET READY for the Lesson

If you could buy a new vehicle today, how long would you want to keep it?

Sam and Kate Hines often drive their SUV to soccer games out of town. They keep their vehicle in good condition to avoid problems while traveling long distances.

Operating and Maintaining Your Vehicle Although the **media** focuses a significant amount of attention on gasoline prices, operating and maintaining a vehicle involves numerous costs. They can be classified as variable costs and fixed costs. **Variable costs** increase as the number of miles driven increase. They include the cost of gasoline, oil, filters, tires, and repairs. **Fixed costs** remain about the same regardless of how many miles you drive. They include insurance, registration fees, loan interest, and depreciation. **Depreciation** is the decrease in the value of your vehicle from one year to the next because of its age and condition. You can compute the depreciation using this formula:

$$\text{Depreciation} = \frac{\text{Purchase Price} - \text{Today's Value}}{\text{Number of Years Owned}}$$

You use the cost per mile of operating a vehicle to compare the costs of driving various vehicles. Calculate the cost per mile as follows:

$$\text{Cost per Mile} = \frac{\text{Annual Variable Cost} + \text{Annual Fixed Cost}}{\text{Number of Miles}}$$

EXAMPLE 1

Chantal Jones purchased a new two-door coupe for $24,590 two years ago. She drove 14,322 miles last year and kept a record of all auto expenses. She estimates the vehicle's present value at $19,219. Calculate her (a) depreciation, (b) total variable costs, (c) total fixed costs, and (d) cost per mile to operate her vehicle last year.

Variable Costs		Fixed Costs	
Gasoline	$1,576.24	Insurance	$985.00
Oil Changes	71.85	License/registration	125.63
Maintenance	154.36	Loan Interest	380.30
Cleaning, tolls and Parking	322.65	Depreciation	a.
Total	b. $	Total	c. $

is classified B, 15.

9. Magdalena Castillo uses her SUV mainly for pleasure. She has 100/300 bodily injury and $50,000 property damage coverage. Her driver-rating factor is 2.15, and her SUV is classified as C, 15.

10. Carl Adams uses his minivan to deliver office supplies. He has 100/200 bodily injury and $50,000 property damage coverage. Because of the business use of his van, his driver-rating factor is 3.10. His van is classified as D, 14.

11. **CHALLENGE PROBLEM** Ned Bishop delivers firewood to retail outlets in his truck. His driver-rating factor is 3.15. His insurance coverage includes 25/100 bodily injury and $25,000 property damage. He has $50-deductible comprehensive and $50-deductible collision. His truck is in age group D and insurance-rating group 10. Calculate his annual (a) base premium and (b) premium and then (c) his annual premium if he gets a 20% discount by increasing his deductible to $200.

12. **CHALLENGE PROBLEM** Pamela Kruse drives to and from work in her red sports car. Her driver-rating factor is 4.85. Her insurance coverage includes 100/200 bodily injury and $100,000 property damage. She has $50-deductible comprehensive and $50-deductible collision coverage. Her car is in age group A and insurance-rating group 13. How much more will her annual premium be if she increases the liability coverage to 300/300/100?

Spiral Review

Multiply. (Skill 8)

13. 1.25×79.90 14. 2.40×360 15. 3.90×67.70

16. Ona Scully's charge account statement showed a previous balance of $523.94, a finance charge of $8.96, new purchases of $154.21, $34.28, and $75.21, a credit of $45.16, and a $250.00 payment. What is her new balance? (Lesson 7.1)

17. **ALGEBRA** Matthew Epstein sells appliances. He receives weekly pay on a straight commission of 5% on sales up to $5,000 and 6% on sales over $5,000. One week Matthew had a gross pay of $652. What was his sales total for that week? (Lesson 1.7)

GET READY for the Next Lesson

PREREQUISITE SKILL Dividing (Decimal Remainder) (Skill 10)
Divide. Round answers to the nearest hundredth.

18. $751 \div 305$

19. $846 \div 120$

20. $688 \div 321$

21. $5,489 \div 294$

22. $776 \div 492$

23. $963 \div 3,500$

Step 1: Find the annual base premium.

$$\underset{\substack{\text{Liability} \\ \text{Premium}}}{\$344} + \underset{\substack{\text{Collision} \\ \text{Premium}}}{\$300} + \underset{\substack{\text{Comprehensive} \\ \text{Premium}}}{\$113} = \$757 \text{ annual basic premium}$$

Step 2: Find the annual premium.

Base Premium × Driver-Rating Factor

$$\$757.00 \times 2.20 = \$1,665.40 \text{ annual premium}$$

344 **+** 300 **+** 113 **=** 757 **×** 2.2 **=** 1665.40

✔ Concept CHECK

Use Figure 9.3 on page 351 to find the (a) annual base premium and (b) annual premium. Check your answers in the back of the book.

1. Fran Nader's insurance covers bodily injury 25/100 and $100,000 property damage. It has a $50-deductible comprehensive and a $50-deductible collision. Her car is in age group C and insurance-rating group 10 (or C, 10), and her driver-rating factor is 1.50.

Lesson Practice

For Problems 2–10, determine the (a) annual base premium and (b) the annual premium. Use Figure 9.3 on page 351 for insurance premiums. All policies have a $50 deductible for both comprehensive and collision.

2. Pierce Keenan has a 1.30 driver-rating factor and his car is in age group A and insurance-rating group 14. The coverage he wants is 50/100 bodily injury and $25,000 for property damage.

3. Danielle Cecil's driver-rating factor is 1.60 and her car is in age group D and insurance-rating group 12. She wants 100/300 bodily injury and $50,000 property damage coverage.

4. Marcy Kirkpatrick uses her vehicle primarily for pleasure. She has 100/200 bodily injury and $25,000 property damage coverage. Because of her excellent driving record, her driver-rating factor is 1.00. Her vehicle is classified as B, 14.

5. Jill Wilson uses her vehicle primarily for pleasure. She has 100/300 bodily injury, and $50,000 property damage coverage. Because of her excellent driving record, her driver-rating factor is 1.00. Her vehicle is classified as A, 14.

6. Samuel Haskins uses his minivan primarily for his delivery business. He has 100/300 bodily injury, and $100,000 property damage coverage. Because of his business use, his driver-rating factor is 3.55. His vehicle is classified A, 15.

7. Ruby Mason uses her sports car mainly for pleasure. She has 100/200 bodily injury, and $100,000 property damage coverage. Her driver-rating factor is 2.65 and her sports car is classified as B, 15.

The **annual premium** is the amount you pay each year for insurance coverage: These factors determine your annual premium:

1. The cost of the *annual base premium,* which depends on the amount and type of coverage you carry.
2. The *driver-rating factor,* which depends on your age, marital status, number of miles you drive each week, whether you drive a long distance to work, and if you use your vehicle for pleasure or business.

If several people drive your vehicle, the insurance company uses the highest driver-rating factor among them to determine the annual premium. Insurance companies use tables to determine your basic premium. You use these two formulas to determine the annual premium:

$$\text{Annual Base Premium} = \frac{\text{Liability}}{\text{Premium}} + \frac{\text{Collision}}{\text{Premium}} + \frac{\text{Comprehensive}}{\text{Premium}}$$

$$\text{Annual Premium} = \text{Annual Base Premium} \times \text{Driver-Rating Factor}$$

EXAMPLE

Della Welch is the principal operator of her vehicle. Her driver-rating factor is 2.20. Her insurance includes 50/100 bodily injury and $50,000 property damage. Her vehicle is in age group A and insurance-rating group 13 (or A, 13). She has $50-deductible comprehensive and $50-deductible collision insurance. What is her annual base premium? What is her annual premium? Use **Figure 9.3** to find insurance rates.

Figure 9.3

Annual Liability Premium						
Property Damage Limits	Bodily Injury Limits					
	25/50	25/100	50/100	100/200	100/300	300/300
$ 25,000	$299	$319	$309	$365	$374	$416
50,000	307	326	344	374	383	425
100,000	464	338	357	386	394	437

Collision and Comprehensive Premium							
Coverage	Age Group	Insurance Rating Group					
		10	11	12	13	14	15
Collision	A	$236	$257	$279	$300	$322	$343
$50 Deductible	B	224	243	264	284	305	325
	C	213	233	253	272	291	310
	D	203	222	240	259	277	296
Comprehensive	A	$80	$86	$99	$113	$127	$142
$50 Deductible	B	68	82	94	107	121	134
	C	65	77	90	102	115	129
	D	62	73	86	97	110	122

Vehicle Insurance

GET READY for the Lesson

Why does a car owner need insurance?

Judy Watson's car hit another car. She was glad she had good insurance when she found out how much the repairs would cost.

Buying Vehicle Insurance If your vehicle is involved in an accident, it can cause bodily **injury** to the people involved, property damage to other vehicles or property, such as light poles, and collision damage to your vehicle. Vehicle owners carry insurance to cover the costs associated with an accident.

Liability insurance coverage provides financial protection to the policyholder against claims for bodily injury and property damage as a result of an accident. The combined coverage is often listed as 100/300/50. The 100/300 refers to the bodily injury coverage and means:

The insurance company will pay up to $100,000 to any *one* person injured. ⟶	100/300 ⟵	The insurance company pays up to $300,000 if *more than one* person is injured.

The *50* refers to a property damage limit of $50,000.

In addition to liability insurance, you also will need to consider carrying two other types of insurance on your vehicle. **Collision insurance** pays for damage to the insured vehicle caused by a collision with another motor vehicle or an object such as a telephone pole. **Comprehensive insurance** pays for damage to the insured vehicle from losses due to fire, vandalism, theft, and just about any cause other than a collision.

Both collision and comprehensive insurance may have a **deductible clause.** This is a clause in an insurance policy that requires the insured to pay a certain amount to cover repairs before the insurance company pays. For example, if your insurance policy states that you have a $500-deductible clause, this means that you pay the first $500 of the repair bill. If your total repair bill is $4,400, you have to pay $500 and the insurance company pays the remaining amount ($3,900 in this example).

The annual *base premium* determines the cost of your vehicle insurance. It involves three factors:
- the amount of insurance you carry,
- how old your vehicle is, and
- the insurance-rating group depending on the size and value of your vehicle.

Lesson Practice

For Problems 4–8, use Figure 9.2 to find the average retail value and the average retail price.

	Model	Average Retail Value	A/C	DVD Player	Power Mirror	Leather Seats	Bucket Seats	Power Sunroof	Mileage	Average Retail Price
4.	V6 four-dr	a. $	Yes	No	Yes	No	Yes	No	35,000	b. $
5.	V6 four-dr	a.	No	No	No	Yes	No	Yes	58,400	b.
6.	V8 four-dr	a.	Yes	Yes	Yes	Yes	No	Yes	80,255	b.

7. Monica Rizzo wants to buy a 4-year-old V6 four-door sedan that has 52,686 miles. It has manual transmission, a DVD player, leather seats, front bucket seats, and power sunroof but no air conditioning.

8. Kurt Sorensen is looking at a 4-year-old V8 four-door sedan that has 80,575 miles. It also has a DVD player, power mirrors, leather seats, front bucket seats, and a power sunroof.

9. Use Figure 9.2 to calculate the average wholesale price for Kordell Henson's 4-year-old V6 four-door sedan. It has 126,540 miles, manual transmission, leather seats, a DVD player, power sunroof, aluminum wheels, and bucket seats.

H.O.T. Problems

10. CHALLENGE PROBLEM Yen Luong owns a used pickup truck that she wants to sell. A used-vehicle guide shows that its average retail value is $17,600. She adds $1,700 for 4-wheel drive, $475 for an entertainment system, $800 for a special trim package, and $225 for power locks. She also adds $125 for a sliding rear window, $325 for a towing package, $250 for power windows, and $3,125 for a diesel engine. She deducts $675 for having a manual transmission. She adds $450 for having less than the expected mileage. What is the average retail price of Yen's vehicle?

Spiral Review

Subtract. (Skill 4)

11. 8,450 – 475　　　**12.** 3,890 – 2,530　　　**13.** 2,205 – 225

14. Find Randall Kramer's average monthly expenditure if his expenses were: October, $1,423; November, $1,164; December, $1,987. (Lesson 3.1)

15. Your checking account balance is $226.34 on June 4. You write a $15.28 check on June 9 and a $61.80 check on June 14. On June 15, you deposit your $228.23 paycheck. What is your checking account balance then? (Lesson 4.3)

GET READY for the Next Lesson

PREREQUISITE SKILL Multiplying Decimals (Skill 8)

Multiply.

16. 2.46 × 5.93　　　**17.** 7.33 × 8.50　　　**18.** 44.8 × 56.1

19. 270.76 × 27.06　　　**20.** 10.73 × 6.72　　　**21.** 93.10 × 94.04

Figure 9.2

Figure 9.2

Palomino Four-Year-Old Sedan	Average Retail Value	Average Wholesale Value
V6 Four-Door	$15,500	$13,100
V8 Four-Door	16,675	13,270
Adjustments for Retail or Wholesale		
Deduct w/o Air Conditioning	$850	
Deduct Manual Transmission	650	
Add DVD Player	540	
Add Power Mirrors	250	
Add Leather Seats	240	
Add Front Bucket Seats	220	
Add Power Sunroof	475	
Add Aluminum Wheels	120	

Mileage Deduction		
40,001–50,000	$175	
50,001–60,000	$675	
60,001–70,000	$1,225	
70,001–80,000	$1,775	
80,001–90,000	$2,025	
90,001–100,000	$2,200	
More than 100,001		
$2,200 + $150 per 10,000		

Concept CHECK

Use Figure 9.2 to complete the problem. Check your answer in the back of the book.

1. Find the average retail price for a 4-year old V6 four-door sedan with air conditioning, power mirrors, leather seats, power sunroof, and aluminum wheels. It has been driven 42,510 miles.

EXAMPLE 2

Using Figure 9.2, find the average wholesale price for a 4-year-old V8 four-door that has no air conditioning but does have a DVD player and a power sunroof. It has 63,580 miles.

$$\begin{array}{c} \text{Average} \\ \text{Wholesale Price} \end{array} = \begin{array}{c} \text{Average} \\ \text{Wholesale Value} \end{array} + \begin{array}{c} \text{Additional} \\ \text{Options} \end{array} - \begin{array}{c} \text{Options} \\ \text{Deductions} \end{array} - \begin{array}{c} \text{Mileage} \\ \text{Deductions} \end{array}$$

$13,270 + ($540 + 475) - $850 - $1,225$

$13,270 + $1,015 - $850 - $1,225 = $12,210$ average wholesale price

Concept CHECK

Use Figure 9.2 to complete problems 2 and 3. Check your answers in the back of the book.

2. Find the average wholesale price for a used V6 four-door sedan with air conditioning, leather seats, front bucket seats, power sunroof, and aluminum wheels. It has 75,500 miles.

3. Jacob North wants to buy a four-year-old Palomino sedan. His friend has a V8 four-door that he will sell Jacob at wholesale. The car has a manual transmission, a DVD player, leather seats, a power sunroof and 53,480 miles. Premier Certified Pre-Owned Autos has a V6 four-door that is being sold at retail. That car has power mirrors, front bucket seats, aluminum wheels, and 73,840 miles. It does not have air conditioning. Which car will cost Jacob less and how much less?

Purchasing a Used Vehicle

GET READY for the Lesson

Why do you think people buy used vehicles?

A buyer's guide gives information about a used car's warranty, if any, and some of the major mechanical and electrical problems it has.

Purchasing a Used Vehicle Dealers must display a buyer's guide sticker in the window of a used vehicle for sale. Dealers usually advertise used vehicles for prices that are higher than they expect you to pay. A used-vehicle guide gives the average prices for used vehicles. The National Automobile Dealers Association (NADA) and Vehicle Market Research (VMR) guides **published** monthly give the average prices for vehicles purchased from dealers during the previous month. Information from Web sites such as Kelley Blue Book and Edmunds can help you decide how much to pay for a used vehicle.

A merchant makes a *retail* sale directly to the customer. Merchants buy at a *wholesale* price. Calculate the average retail price of a used vehicle using this formula:

$$\text{Average Retail Price} = \text{Average Retail Value} + \text{Additional Options} - \text{Options Deductions} - \text{Mileage Deduction}$$

## EXAMPLE 1

Caryn Demaline wants to purchase a 4-year-old Palomino V8 four-door sedan advertised for $16,450. It has a DVD player, power mirrors, and a power sunroof but no air conditioning. It has been driven 51,760 miles. Use the data in **Figure 9.2** on page 348 to find the average retail price Caryn should keep in mind when she makes an offer for the vehicle.

Find the average retail price.

$$\text{Average Retail Price} = \text{Average Retail Value} + \text{Additional Options} - \text{Options Deductions} - \text{Mileage Deductions}$$

$16,675 + ($540 + 250 + 475) - $850 - $675 =

$16,675 + $1,265 - $850 - $675 = $16,415 average retail value

Caryn needs to remember the $16,450 asking price and the $16,415 average retail price.

540 [+] 250 [+] 475 [M+] 1265 16675 [+] [RM] 1265 [-] 850 [-] 675 [=] 16415

8. Elliott Sutor is considering a truck with a $23,855 base price, $2,856 options total, and a $910 destination charge. The dealer's costs are 90.5% of the base price and 87% of the options price.

9. Jace Fontana is looking at a new sedan with a $27,680 base price, $2,495 options total, and a $680 destination charge. The dealer's costs are 92.5% of the base price and 88.3% of the options price. What are the car's (a) total sticker price and (b) dealer's cost?

10. Poloma Caetano is considering the purchase of a large SUV. She sees one with a $38,988 base price, $3,275 options total, and $735 destination charge. She estimates the dealer's costs as 88% of the base price and 80% of the options price. If Poloma offers the dealer $250 above the estimated dealer's cost, what is her offer?

11. Deanne Baldwin offered an automobile dealer $150 over the estimated dealer's cost on a car with a base price of $24,495 and options total $1,600. The dealer's costs were 89.7% of the base price and 81.0% of the options. The destination charge was $720. What was her offer?

12. **CHALLENGE PROBLEM** Evander King is ordering a luxury convertible. The base price is $81,975. Options include satellite radio, $475; keyless entry, $555; navigation system, $1,250; and custom paint, $983. The destination charge is $890. The dealer's costs are 90% of the base price and 88% of the options price. The dealer will sell Evander the car for $200 more than the dealer's cost plus a 6% sales tax. What is the total cost of the convertible, including tax?

13. **ALGEBRA** Joe Dooley checked the Internet to find the dealer's cost of a new truck. He found that the dealer's costs were $14,772.60 of base price and $833.00 of options price. The destination charge was $250.00. If the dealer's costs are 87% of base price and 85% of options, find the truck's sticker price.

14. **ALGEBRA** Di Lanier has her eye on a four-door sedan in the dealer's showroom. She checks the Internet to find that the dealer's costs are $19,972.58 base price, and options are moon roof wind deflector, $84.00; emergency aid package, $117.60; and floor mats, $147.00. The destination charge is $598.00. The dealer's cost of base price is 82% and of options is 84%. If Di pays the sticker price plus a 6% sales tax, what is her cost?

H.O.T. Problems

Spiral Review

Find the percent. (Skill 30)

15. 15% of 980
16. 22% of 756
17. 78% of 3,440

18. **ALGEBRA** Todd Hess found an ad this week stating "Save $125.00 on area rugs. All 10' by 12' area rugs marked down 35%." What is a 10' by 12' area rug's regular selling price? (Lesson 6.6)

19. Sara Lucas is a lifeguard. She earns $8.25 per hour. This week she worked $37\frac{1}{2}$ hours. What is her straight-time pay for the week? (Lesson 1.1)

GET READY for the Next Lesson

PREREQUISITE SKILL Subtracting Whole Numbers (Skill 4)

Subtract.

20. 4,850 − 561
21. 6,334 − 3,140
22. 4,445 − 1,729

EXAMPLE 2 Algebra

Abbie Williamson checked the Internet to find the dealer's cost of the domestic hybrid sedan she wanted to purchase. She found that the dealer's base cost was $21,971.90 and the dealer's cost for options was $2,459.60. The dealer would pass the $298.00 destination charge on to the consumer. If the percent of the dealer's cost is 82% and of dealer's cost of options is 86%, find the car's sticker price.

Step 1: Let b = Base price of the car

Dealer's Cost = Base Price $\times$ Dealer's Percent

$21,971.90 = b \times 82\%$

Divide both sides by 0.82

$26,795.00 = b$

Step 2: Let s = Price of the options

Dealer's Options Cost = Total Options $\times$ Dealer's Percent

$2,459.60 = s \times 86\%$

Divide both sides by 0.86

$2,860.00 = s$

Step 3: Find the sticker price.

Sticker Price = Base Price + Options + Destination Charge

$26,795.00 + $2,860.00 + $298.00 = $29,953.00 sticker price

Concept CHECK

Complete the problem. Check your answer in the back of the book.

2. Omar and Zina Aboud found that the dealer's cost of the base price was $16,558.16 and the dealer's options cost was $611.60. The consumer paid the $475.00 destination charge. If the percent of the dealer's cost is 92% and the percent of dealer's options cost is 88%, find the car's sticker price.

Lesson Practice

For Problems 3–8, calculate the dealer's cost.

Base Price		Dealer's Percent		Option Price		Dealer's Percent		Destination Charge		Dealer's Cost
3. $25,800	$\times$	85.0%	+	$2,200	$\times$	88.0%	+	$660		
4. 36,890	$\times$	87.0	+	5,680	$\times$	91.0	+	980		
5. 48,990	$\times$	91.5	+	1,200	$\times$	85.0	+	770		

6. Gretchen Utley is considering the purchase of a station wagon. Its base price is $37,125, options total is $2,975, and destination charge is $870. The dealer's costs are 93% of base price and 91% of options price.

7. Lonnie Burrows is purchasing a sedan with a $29,375 base price, $4,200 options total, and $840 destination charge. The dealer's costs are 91.7% of base price and 83.3% of options price.

Dealer's Cost

Lesson Objective
Calculate the dealer's cost of a new vehicle.

Content Vocabulary
- dealer's cost

As You Read

Summarize
What is the dealer's cost of a vehicle?

GET READY for the Lesson

Why do you pay more than the dealer does when you buy a car?

Serena Gamble just bought a new car. She realized that the dealer paid less than the sticker price.

Calculating Dealer's Cost In Lesson 9.1, you learned that vehicle dealers place a "sticker price" on a new vehicle. In order to make a profit the dealer pays less than the sticker price for both the basic vehicle and the options. Internet sites show the sticker price and the invoice price or dealer's cost of a vehicle. **Consumer** magazines often report the **dealer's cost** as a percent of the base price plus a percent of the options price plus the destination charge. You may save money when purchasing a new vehicle by making an offer that is higher than the estimated dealer's cost but lower than the sticker price. Keep this in mind as you work through this section. Use this formula to calculate the dealer's cost.

Dealer's Cost = Percent of Base Price + Percent of Options Price + Destination Charge

EXAMPLE 1

The pickup truck sticker shows a base price of $41,036.00, with options totaling $2,425.00 and a destination charge of $850.00. *Consumer Reports* shows the dealer cost as 87.7% of the base price and 90.2% of the options. What is the dealer's cost?

Step 1: Find the percent of base price.

$41,036.00 × 87.7% = $35,988.57

Step 2: Find the percent of options price.

$2,425.00 × 90.2% = $2,187.35

Step 3: Find the dealer's cost.

Percent of Base Price	+	Percent of Options Price	+	Destination Charge		
$35,988.57	+	$2,187.35	+	$850.00	=	$39,025.92 dealer's cost

Concept CHECK

Complete the problem. Check your answer in the back of the book.

1. At Lakeland Autos, the dealer's cost on an SUV is 88% of the $53,105 base price and 90% of the $1,785 options price plus a $640 destination charge. Find the dealer's cost for the SUV.

Lesson Practice

Find the sticker price.

	Base Price	Options	Destination Charge	Sticker Price
4.	$19,900	$2,400	$350	$
5.	21,540	1,260	345	
6.	32,654	4,865	338	
7.	49,842	3,861	425	

8. Dalton Slade is interested in an SUV that has a $31,145 base price. Factory-installed options include folding rear seat, $325; front leather trim split bench seat, $425; sport package, $690; tow package, $650; engine block heater, $85; and optional 4-wheel drive, $950. The destination charge from its assembly plant in Michigan is $852. What is this SUV's sticker price?

9. Andy Tedesco is interested in buying a small pickup with a base price of $31,100. It has these options: stereo/CD player/navigation system, $1,445; power sunroof, $850; security package, $640; aluminum wheels, $545; tubular side steps, $525; heated front seats, $250; trailer tow group, $525; pearlcoat paint, $225; and all-terrain tires, $100. Its destination charge is $645. Determine its sticker price.

10. Devin and Marlika Randolph are shopping for a new minivan with all-wheel drive. Its base price is $25,535. The options are a touch-screen DVD/TV at $650, satellite navigation system at $225, a heavy-duty engine cooling system at $354, a trailer-tow package at $568, and a keyless entry system at $332. The destination charge is $850. What is the minivan's sticker price?

11. **ALGEBRA** Betty Richard's new luxury sedan has a $43,895.60 MSRP including title and processing fees. The navigation system cost twice as much as the upgraded sound system, which included AM/FM stereo with CD/MP3 player, and 9 speakers. Including the 6.5% sales tax, the total cost of her new auto was $48,346.31. Find the cost of the upgraded sound system and the navigation system.

H.O.T. Problems

Spiral Review

Add. (Skill 3)

12. 8,850 + 995 + 660 + 242

13. 6,770 + 1,217 + 648 + 344 + 85

14. Penny Banks purchased a new washer and dryer for $1,526.39. She used the store's credit plan and made a 25% down payment. How much did she finance? (Lesson 8.2)

15. Determine the future value of $4,000 deposited into an ordinary annuity after each quarter for 3 years at 6% interest compounded quarterly. (Lesson 5.8)

GET READY for the Next Lesson

PREREQUISITE SKILL Finding the Percentage (Skill 30)

Find the percentage.

16. 8% of 649

17. 78% of 454

18. 19% of 936

Step 1: Find the options price.

$665 + $925 + $460 = $2,050 options price

Step 2: Find the sticker price.

Base Price + Options + Destination Charge

$30,665 + $2,050 + $745 = $33,460 sticker price

✓ Concept CHECK

Find the sticker price. Check your answers in the back of the book.

1. River City Autos has a pickup truck for sale. Its base price is $22,225. Prices for available options are 6-speed transmission, $2,908; cruise control, $240; trailer towing package, $230; and power windows, $738. Its destination charge is $900.

2. Coble Downtown is selling a sport coupe hybrid at a base price of $24,990. Options are the convenience package, $1,300; sunroof, $850; and sunroof wind deflector, $100. Destination charge is $625.

EXAMPLE 2 Algebra

Anna and Luke Shore are purchasing a new sport utility vehicle (SUV) with an MSRP of $25,525.00 including the delivery, processing, and handling fee. The Driver Convenience Package, which includes mounted radio controls and power seats, costs five times the amount of the Appearance Package, which includes body side molding and chrome inserts. The SUV's total cost is $29,137.41, including a 6.75% sales tax. What is the cost of the Appearance Package and the Driver Convenience Package?

Let x = Cost of appearance package

Let $5x$ = Cost of convenience package

$$\text{Total Cost} = \text{Base Price} + \text{Destination Charge} + \text{Appearance Pkg.} + \text{Convenience Pkg.} + \text{Tax}$$

$29,137.41 = ($25,525.00 + x + 5x) + 6.75\%($25,525.00 + x + 5x)$

Combine like terms

$29,137.41 = ($25,525.00 + 6x) + 0.0675($25,525.00 + 6x)$

Apply the distributive property

$29,137.41 = $25,525.00 + 6x + $1,722.9375 + 0.405x$

Combine like terms

$29,137.41 = $27,247.9375 + 6.405x$

Subract $27,247.9375 from both sides

$1,889.4725 = 6.405x$

Divide both sides by 6.405

$295 = x$

The Appearance Package costs $295.

The Driver Convenience Package costs 5 × $295 = $1,475.

✓ Concept CHECK

Complete the problem. Check your answer in the back of the book.

3. Nayan Patel purchases a compact vehicle with an MSRP of $17,980.00, including the destination charge and title fee. He selects a 6-way power front passenger seat, which costs 10 times the amount of remote keyless entry. The total cost of the compact vehicle, including a 7% sales tax, is $19,591.70. Find the cost of the power front passenger seat and the remote keyless entry.

LESSON 9.1

Purchasing a New Vehicle

Lesson Objective
Compute the sticker price of a new vehicle.

Content Vocabulary
- sticker price
- base price
- options
- destination charge

As You Read

Identify What is the sticker price?

> ▶ **GET READY for the Lesson**
>
> **When can you generally get the best price on new vehicles?**
>
> Sandy Lim is planning to buy a new car in the fall. Many manufacturers are eager to sell the past year's models in the fall to make way for new ones.

Computing the Sticker Price Laws require vehicle manufacturers to display a buyer's guide sticker on a new vehicle's window that shows the price. The **sticker price** includes three charges.

The **base price**, sometimes referred to as the *manufacturer's suggested retail price* (MSRP), is the price of the engine, chassis (that is, the vehicle's frame), and any other standard equipment for a particular model. **Options** are extra equipment for convenience, safety, or appearance, such as a sunroof, air conditioning, and tinted glass, not included in the base price. The **destination charge** is the cost of shipping the vehicle from the factory to the dealer.

Therefore, the sticker price is the total of the base price, options, and destination charge.

Sticker Price = Base Price + Options + Destination Charge

Some dealers add other charges such as a dealer preparation ("prep") charge for servicing the vehicle before delivering it to the consumer as well as various other delivery, processing, and handling fees such as a title fee.

Need Help? Go to...
- ▶ Workshop 4: Adding Decimals, p. 10
- ▶ Skill 5: Adding Decimals, p. SK6

Figure 9.1

EXAMPLE 1

Scott Oliver is shopping for a sports car. See **Figure 9.1** for a portion of the sticker for a convertible. What is this vehicle's sticker price?

Zephyr Convertible	
Base Price	$30,665
Optional Equipment	
5-Speed Automatic Transmission	665
Polished Aluminum Wheels	925
Interior Upgrade	460
Destination Charge	745