**Chapter 1**

**Problem Solving**

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| **Four Step Approach to Problem Solving**1. **Understand the Problem** What is the unknown? What information is being given? What is being asked?**2. Make a Plan** Use a verbal model to write an equation.3. **Solve the Problem** Carry out your plan. Check that each step is correct. 4. **Look Back** Examine your solution. Check that your solution makes sense in the original statement of the problem.  |

1. In the 2012 Olympics, Usain Bolt won the 200-meter dash with a time of 19.32 seconds. Write and solve an equation to find his average speed to the nearest hundredth.

2. On January 22, 1943, the temperature in Spearfish, South Dakota, fell from $54℉$ at 9:00 A.M. to $-4℉$ at 9:27 A.M. How many degrees did the temperature fall?

3. You spend $30.40 on 4 CDs. Each CD costs the same amount and is on sale for 80% of the original price.

a. Write and solve an equation to find how much you spend on each CD.

b. The next day, the CDs are no longer on sale. You have $25. Will you be able to buy 3 more CDs? Explain your reasoning.

4. Use the table to find the number of miles x you need to bike on Friday so that the mean number of miles biked per day is 5.

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| Day | Miles |
| Monday | 3.5 |
| Tuesday | 5.5 |
| Wednesday | 0 |
| Thursday | 5 |
| Friday | x |

5. Your school’s drama club charges $4 per person for admission to a play. The club borrowed $400 to pay for costumes and props. After paying back the loan, the club has a profit of $100. How many people attend the play?

6. A boat leaves New Orleans and travels upstream on the Mississippi River for 4 hours. The return trip takes only 2.8 hours because the boat travels 3 miles per hour faster downstream due to the current. How far does the boat travel upstream?

7. Paul bikes for 3 hours to reach his favorite beach. He bikes 2 miles per hour faster on the way back. So, the trip back takes only 2.5 hours. How fast did he bike going to the beach?

8. You and your friend drive toward each other. The equation $50h=190-45h$ represents the number h of hours until you and your friend meet. When will you meet?

9. The equation $1.5r+15=2.25r$ represents the number r of movies you must rent to spend the same amount at each movie store. How many movies must you rent to spend the same amount at each movie store?

10. A cheetah that is running 90 feet per second is 120 feet behind an antelope that is running 60 feet per second. How long will it take the cheetah to catch up to the antelope?

11. A cheetah can run at top speed for only about 20 seconds. If an antelope is too far away for a cheetah to catch it in 20 seconds, the antelope is probably safe. Your friend claims the antelope in example 10 will not be safe if the cheetah starts running 650 feet behind it. Is your friend correct? Explain.

12. You want to paint a piece of pottery at an art studio. The total cost is the cost of the piece plus an hourly studio fee. There are two studios to choose from.

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| **Studio A Studio B**Vase: $10 Vase: $16Studio Fee: $8 per hour Studio Fee: $6 per hour |

a. After how many hours of painting are the total costs the same at both studios?

b. Studio B increases the hourly studio fee by $2. How does this affect your answer in part a? Explain