

## 4-7

NAME \_\_\_\_\_ DATE \_\_\_\_\_

**Weighted Averages** (Pages 233–238)

Sometimes the numbers that go into an average do not all have the same weight or importance. In such cases, you may want to use a **weighted average**. Two applications of weighted averages are mixture problems and problems involving **uniform motion**, or motion at a constant rate or speed. The formula  $distance = rate \cdot time$ , or  $d = rt$  is used to solve uniform motion problems.

**EXAMPLE**

How much pure juice and 20% juice should you mix to make 4 quarts of 50% juice?

Let  $p$  = the amount of pure juice to be added. Then, make a table of the information.

Next, write an equation with the expression for each amount of juice.

pure juice + 20% juice = 50% juice

$$p + 0.2(4 - p) = 2$$

$$p + 0.8 - 0.2p = 2$$

$$(1 - 0.2)p + 0.8 = 2$$

$$0.8p + 0.8 = 2$$

$$0.8p = 1.2$$

$$p = 1.5$$

	Quarts	Amount of Juice
<b>Pure juice (100%)</b>	$p$	100% of $p = 1 \cdot p$ or $p$
<b>20% juice</b>	$4 - p$	20% of $4 - p = 0.2(4 - p)$
<b>50% juice</b>	4	50% of 4 = $0.5 \cdot 4$ or 2

You should mix 1.5 quarts of pure juice with  $4 - 1.5$  or 2.5 quarts of 20% juice to obtain a 4 quart mixture that is 50% juice.

**PRACTICE**

- 1. Entertainment** Symphony tickets cost \$16 for adults and \$8 for students. A total of 634 tickets worth \$8432 were sold. Use the table to find how many adult and student tickets were sold.

	Number Sold	Price Per Ticket	Total Price
<b>Adult Tickets</b>	$x$		
<b>Student Tickets</b>	$634 - x$		

- 2. Transportation** A truck and a jeep leave Melbourne, the truck heading east and the jeep heading west. The jeep is traveling 5 mph slower than the truck. In 3 hours, the vehicles are 465 miles apart. Draw a diagram of the situation and then use the table to find the speed of each vehicle. (*Hint*: eastbound distance + westbound distance = total distance apart.)

	Rate (mph)	Time (hours)	Distance (miles)
<b>Truck</b>	$x$	3	
<b>Jeep</b>		3	



- 3. Standardized Test Practice** A group of twenty people bought popcorn at a movie. A regular popcorn cost \$2 and a large popcorn cost \$3. If the total bill for popcorn was \$49, how many bags of each size did they buy?
- A** 5 regular, 15 large                      **B** 12 regular, 8 large  
**C** 11 regular, 9 large                      **D** 7 regular, 13 large

Answers: 1. 420 adult, 214 student; 2. See Answer Key for diagram; truck: 80 mph, jeep: 75 mph; 3. C