

## Hints and Answers to Selected Exercises

**Note to students:** The selected answers below give you some indication about whether you are on the right track. They are NOT intended to be the type of answers you would turn in to an instructor. Your complete answers should contain all the work towards obtaining an answer, as described in the Message to Prospective Teachers.

### *2 Quantitative Analysis*

1. 111 cm.

### *3.1 Values of Quantities*

2. b. miles per gallon  
d. no; city vs. highway driving, low speed vs. high speed, etc.  
e. gallons per mile

### *4 Fractional Values of Quantities*

2.  $\frac{7}{12}$  is more than  $\frac{1}{2}$  and  $\frac{5}{8}$  is more than  $\frac{1}{2}$ , so the sum is more than 1.  $\frac{23}{24}$  is less than 1 so it is incorrect.
6. d.  $\frac{2}{5}$  is less than  $\frac{1}{2}$  and  $\frac{3}{6}$  is equal to  $\frac{1}{2}$  so therefore  $\frac{3}{6}$  is larger.
8. a.  $0.125 = 12.5\%$   
k.  $0.66666\dots = 66\frac{2}{3}\%$
9. a. slightly less than  $\frac{1}{4}$   
d. slightly more than  $\frac{1}{3}$
10. d. This is about  $\frac{2}{3}$  of 24 which is 16.

### *5.1 Quantitative Analysis*

3. 50 students
4. C and D are combined, A and B are combined, A and D are compared, B and C are compared.
7. a. Annie weighed  $1\frac{3}{4}$  pounds less than Carmen on that day
10.  $\frac{1}{8}$

## ***6.2 Fractions in Multiplicative Comparisons***

More Practice Problems

1. Jack uses  $5\frac{1}{3}$  spools of thread, which is  $3\frac{1}{3}$  spools more than Anh.
2.  $1\frac{6}{7}$  times as many laps as Juan;  $4\frac{2}{7}$  laps farther
3.  $4\frac{4}{19}$  times as many sticks of butter

## ***7 Ratio as Measure***

3. c. ratio of change in y-coordinate to change in x-coordinate  
e. ratio of number of people to number of square miles they live in

## ***7.1 Comparing Ratios***

1. The student column can have 3 or 6 but not 2, 4, or 5.
3. a. stronger than intended  
b. weaker than intended; weaker than first batch.  
c. 5:8; 6:11; etc.  
d. 3:8; 5:11; etc.  
e. 8:8; 10:12; etc.  
f. 1:10; 3:10; etc.
4. c. 9:8; 10:9; etc.  
d. 4:5; 10:11; etc.  
e. 5:1; 10:6; etc.  
f. 1:6; 2:5; etc.
5. 125 tablespoons, or  $7\frac{13}{16}$  cups, of cocoa (assuming each child gets 1 cup of milk).
6. They are the same, because...
7. Hint: Try different values for the distances A and B can travel. Suppose B travels 10 miles in 2 hours, and A travels 12 miles in 3 hours; or 18 miles in 3 hours; or 24 miles in 3 hours. Would these numbers all fit the situation described in #7? Now can you answer the question?

9. B is faster, because...
10. Worker B, because...
11. The \$1.09 can, because...
12. Jane has more.
13. Heath's class is better represented by girls.
14. Car A is more economical, because...

### ***7.2 Percents in Comparisons***

1. The discount on the first coat is 25%; the discount on the second coat is 20%.
2. Better on the exam with 38 correct out of 50.
3. Jane still has more than Scott.
5.
  - a. \$50
  - b. 4 lbs.
  - c. 475 people.
  - d. 400 meters.
  - e. 20 miles.
  - f. 7+ minutes (a little more than 7 minutes).
  - g. \$150+

### ***7.3 Practicing Multiplicative Reasoning***

1. 9 ounces of white paint.
2.  $\frac{9}{20}$  of the wall.
3. 14 parts per hour.
4. 40 liters.
5.  $5\frac{5}{8}$  meters of ribbon.
6. 4 trees.
7. 54 cars.
8. 21 dogs at pound.

9. 70 kg
10. 6 large glasses to fill small jar.
11.  $16\frac{2}{3}$  pounds.
12. 12 chips in  $\frac{2}{3}$  of unit; 27 chips in  $1\frac{1}{2}$  units.
13. 90 km

### ***8 Ways of Thinking About Multiplication***

1. No. When the fraction is greater than 1, the product is greater. You answer why.
3.  $4 \times -2$ : yes;  $-2 \times 4$ : no;  $8 \times \frac{2}{3}$ : yes;  $\frac{2}{3} \times 8$ : no
6. a. ...,  $2\frac{2}{3}$  cups apples, ...  
b. ...,  $1\frac{1}{3}$  cups apples, ...

### ***8.1 Notes for Teaching***

1. The number of points scored by the star player during her senior year was 4 copies of the number of points she scored during her freshman year.

### ***8.2 Division in Multiplicative Settings***

2. This involves sharing the total population equally among 8 cities.

### ***9.2 The Fundamental Counting Principle***

1. a. \$86.72
2. The one at Grand Coulee dam produces more electricity.
3.  $16\frac{2}{3}$  hours.
5. a. You should have 24 color-dot combinations.  
b. 12 girls  
c. 10 outcomes  
d. 36 ways
6.  $2 \times 2 \times 2 \times \dots$
7. a. 62 kinds

- b. If vanilla over chocolate is different from chocolate over vanilla, then there are 1922 kinds.
9. a. 15  
b. 30
10. \$449,496
11. a. 262.104 is greater than 106  
b. 308.9 times as large, or about  $308 \times 10^6$  more