16. Greatest quotient: c; Least quotient: d

17.a) $4\frac{3}{8} \div 3\frac{2}{5}$ is a mixed number since the divisor is smaller than the dividend.

b) $\frac{175}{136}; \frac{136}{175}$ The quotients are reciprocals.

18. Parts a, b, and d have values less than $3\frac{1}{5}$. Parts c, e, and f have values greater than $3\frac{1}{5}$. Part f has a greater value than part e since $\frac{3}{2} > \frac{2}{3}$.

Calculate c and f:

c) $4\frac{4}{5}$ **f)** $4\frac{7}{10}$,

So, c has the greatest value.

19.a) Instead of multiplying, divide by the reciprocal of the second fraction.

b) Answers may vary. For example: No, since drawing number lines to divide takes too long

3.8 Solving Problems with Fractions, page 151

3.a) Addition   **b)** Multiplication
c) Subtraction   **d)** Multiplication

4. $\frac{11}{12}$ cans; Addition

5. 40 goals; Division

6.a) $\frac{1}{2}$; Subtraction   **b)** 15; Multiplication

7. $\frac{7}{12}$ h; Subtraction

8. $960; Multiplication
9. 72 cm; Division

10. $\frac{5}{24}$; Subtraction

11.a) $\frac{1}{2}$ cup; Subtraction   **b)** $1\frac{1}{8}$ cups; Multiplication

c) $1\frac{23}{24}$ cups; Addition **d)** $\frac{13}{24}$ cup; Subtraction

12. $\frac{1}{12}$; Multiplication

13. $\frac{3}{5}$; Subtraction, then multiplication

14. $\frac{17}{24}$; Division

15. The official was puzzled because the sum of $\frac{3}{8}, \frac{3}{5}$, and $\frac{1}{20}$ is greater than 1.

3.9 Order of Operations with Fractions, page 155

4.a) Subtraction   **b)** Multiplication
c) Division   **d)** Addition
5. Raj; Rena added before she multiplied.

6.a) $\frac{11}{20}$; Multiplication **b)** $2\frac{1}{3}$; Division

c) $1\frac{10}{21}$; Division   **d)** $\frac{1}{48}$; Subtraction

e) $1\frac{1}{3}$; Division   **f)** $\frac{8}{9}$; Addition

7.a) $\frac{3}{16}$ **b)** $1\frac{5}{8}$ **c)** $1\frac{2}{3}$ **d)** $1\frac{3}{8}$

8. No; In the first equation you divide first, and in the second equation you multiply first.

9.a) $\frac{2}{5}$ **b)** $1\frac{1}{5}$ **c)** $\frac{1}{2}$

10.a) 4   **b)** $\frac{1}{18}$

11.a) Myra

b) Robert solved $\left(\frac{3}{4} - \frac{1}{2}\right) + \frac{13}{6} \times \frac{1}{2}$ then multiplied by 4. Joe solved $\left(\frac{3}{4} - \frac{1}{2}\right) + \frac{13}{6}$ before multiplying.

12.a) $2\frac{7}{8}$ **b)** $1\frac{5}{8}$ **c)** $5\frac{11}{15}$

Unit 3 Strategies for Success: Checking and Reflecting, page 157

1.a) 3   **b)** $\frac{2}{5}$ **c)** $2\frac{11}{12}$ **d)** $\frac{3}{4}$

2. 12 glasses

3. $\frac{5}{6}$ h

Unit 3 Unit Review, page 159

1.a) $6 \times \frac{2}{5} = 2\frac{2}{5}$ **b)** $3 \times \frac{6}{7} = 2\frac{4}{7}$

2.a) 1   **b)** $3\frac{1}{2}$ **c)** $3\frac{1}{5}$

3.a) 18   **b)** 4   **c)** 50   **d)** $1\frac{1}{2}$

4.a) $\frac{1}{4}$ **b)** $\frac{6}{25}$ **c)** $\frac{21}{40}$ **d)** $\frac{1}{7}$

5. $\frac{3}{20}$

6.a) $\frac{3}{20}$ **b)** $\frac{3}{40}$ **c)** $\frac{7}{20}$ **d)** $\frac{4}{21}$

7. $\frac{3}{10}$

8. For example: $\frac{5}{7}$ of a litter of mice are grey with white patches. The other $\frac{2}{7}$ are black. Of the grey and white mice, $\frac{3}{8}$ are female. What fraction of the litter is grey, white, and female? $\frac{15}{56}$

9.a)
10.a
11.a
12.
13.
14.
15.
16.
17.
18
19
20
2
2
2
2
2