Lesson-by-Lesson Review

Lesson 3-1 Fractions and Decimals (pp. 94–100)

Write each fraction or mixed number as a decimal. Use a bar to show a repeating decimal.

1. $\frac{3}{10}$ **0.3**

2. $\frac{2}{5}$ **0.4**

3. $-\frac{5}{6}$ **−0.8$\overline{3}$**

4. $-7\frac{4}{9}$ **−7.$\overline{4}$**

5. $\frac{5}{8}$ **0.625**

6. $1\frac{4}{15}$ **1.2$\overline{6}$**

Replace each ● with <, >, or = to make a true sentence.

7. $\frac{3}{7}$ ● $\frac{4}{9}$ **<**

8. $-\frac{5}{8}$ ● $-\frac{3}{5}$ **<**

9. $2\frac{1}{2}$ ● $2\frac{5}{12}$ **>**

10. $\frac{5}{8}$ ● 0.625 **=**

11. $4.\overline{37}$ ● $4\frac{19}{50}$ **<**

12. -2.54 ● $-2\frac{27}{50}$ **=**

13. Antoine is cutting a $5\frac{5}{16}$-inch board for a project. Write $5\frac{5}{16}$ as a decimal. **5.3125 in.**

14. A basketball player successfully made 21 out of 39 free throw attempts. To the nearest thousandth, what part of the time was he successful in making his free throws? **0.538**

Example 1

Write $\frac{3}{4}$ as a decimal.

$$\begin{array}{r}0.75 \\ 4\overline{)3.00} \\ -2\,8 \\ \hline 20 \\ -20 \\ \hline 0\end{array}$$

Divide 3 by 4.

Divide until the remainder is zero or until a sequence of numbers repeats.

Example 2

Replace the ● with <, >, or = to make $\frac{4}{5}$ ● 0.75 a true sentence.

$\frac{4}{5}$ ● 0.75   Write the sentence.

0.8 ● 0.75   Write $\frac{4}{5}$ as a decimal.

0.8 > 0.75   In the tenths place, 8 > 7.

Lesson 3-2 Rational Numbers (pp. 101–106)

Write each decimal as a fraction or mixed number in simplest form.

15. 2.08 **$2\frac{2}{25}$**

16. −0.45 **$-\frac{9}{20}$**

17. 0.875 **$\frac{7}{8}$**

18. −0.56 **$-\frac{14}{25}$**

19. $0.\overline{1}$ **$\frac{1}{9}$**

20. $-2.\overline{03}$ **$-2\frac{1}{33}$**

21. $0.\overline{5}$ **$\frac{5}{9}$**

22. $10.\overline{27}$ **$10\frac{3}{11}$**

Identify all sets to which each number belongs.

23. −4 **integer, rational**

24. $3\frac{1}{3}$ **rational**

25. 1.151551555… **irrational**

26. $-0.\overline{67}$ **rational**

27. Suzanne practiced playing the piano for $1.\overline{6}$ hours after school. Write $1.\overline{6}$ as a mixed number. **$1\frac{2}{3}$ h**

28. James rode his motorbike for 10.4 miles in a competition. Write 10.4 as a mixed number. **$10\frac{2}{5}$**

Example 3

Write 1.25 as a fraction in simplest form.

$1.25 = 1\frac{25}{100}$ 1.25 is 1 and 25 hundredths.

$= 1\frac{1}{4}$ Simplify. The GCF of 25 and 100 is 25.

Example 4

Write $0.\overline{7}$ as a fraction in simplest form.

$N = 0.777…$

$10N = 10(0.777…)$ Multiply each side by 10.

$10N = 7.777…$

$-N = 0.777…$ Subtract N from 10N.

$9N = 7$ Simplify.

$N = \frac{7}{9}$ Divide each side by 9.

Lesson 3-3 Multiplying Rational Numbers (pp. 107–112)

Find each product. Write in simplest form.

29. $\frac{1}{5} \cdot \frac{3}{4}$ **$\frac{3}{20}$**

30. $-\frac{3}{7} \cdot \frac{4}{9}$ **$-\frac{4}{21}$**

31. $-\frac{2}{3} \cdot (-5)$ **$3\frac{1}{3}$**

32. $-3\frac{1}{2} \cdot \left(-5\frac{1}{5}\right)$ **$18\frac{1}{5}$**

Evaluate each expression if $a = -\frac{2}{3}$ and $b = -4\frac{1}{4}$.

33. ab **$2\frac{5}{6}$**

34. $2a$ **$-1\frac{1}{3}$**

35. $-4b$ **17**

36. $-3ab$ **$-8\frac{1}{2}$**

37. Mireille has a piece of ribbon that is 10 inches long. Abi's ribbon is $\frac{5}{8}$ as long. How long is Abi's ribbon? **$6\frac{1}{4}$ in.**

38. A liter of water weighs approximately $2\frac{1}{5}$ pounds. While backpacking, Enrique wants to carry $3\frac{1}{2}$ liters of water with him. Find the weight of the water that Enrique is taking with him. **$7\frac{7}{10}$ lb**

Example 5

Find $\frac{3}{8} \cdot \frac{20}{27}$. Write in simplest form.

$\frac{3}{8} \cdot \frac{20}{27} = \frac{3 \cdot 20}{8 \cdot 27}$ Multiply the numerators.
Multiply the denominators.

$= \frac{60}{216}$ or $\frac{5}{18}$ Simplify. The GCF of 60 and 216 is 12.

Example 6

Find $-4\frac{1}{6} \cdot \frac{3}{5}$. Write in simplest form.

$-4\frac{1}{6} \cdot \frac{3}{5} = -\frac{25}{6} \cdot \frac{3}{5}$ Rename $-4\frac{1}{6}$ as an improper fraction.

$= -\frac{\overset{5}{\cancel{25}}}{\underset{2}{\cancel{6}}} \cdot \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{5}}}$ Divide by the GCFs, 5 and 3.

$= -\frac{5}{2}$ or $-2\frac{1}{2}$ Multiply. Then simplify.

Lesson 3-4 Dividing Rational Numbers (pp. 114–119)

Find the multiplicative inverse of each number.

39. -16 **$-\frac{1}{16}$**

40. $\frac{7}{9}$ **$\frac{9}{7}$**

41. $3\frac{4}{5}$ **$\frac{5}{19}$**

42. $-4\frac{1}{3}$ **$-\frac{3}{13}$**

43. $-\frac{1}{11}$ **-11**

44. $2\frac{9}{10}$ **$\frac{10}{29}$**

Find each quotient. Write in simplest form.

45. $\frac{7}{9} \div \left(-\frac{4}{15}\right)$ **$-2\frac{11}{12}$**

46. $-2\frac{2}{3} \div 2\frac{2}{7}$ **$-1\frac{1}{6}$**

47. $\frac{3}{5} \div \frac{9}{10}$ **$\frac{2}{3}$**

48. $3\frac{1}{9} \div \left(-1\frac{1}{6}\right)$ **$-2\frac{2}{3}$**

49. $\frac{4}{5} \div \frac{5}{6}$ **$\frac{24}{25}$**

50. $6\frac{2}{3} \div \left(-3\frac{1}{3}\right)$ **-2**

Find each quotient. Write in simplest form.

51. $\frac{2ab}{3} \div \frac{a}{6}$ **$4b$**

52. $\frac{pq}{5} \div \frac{p}{10}$ **$2q$**

53. $\frac{3ab}{2} \div \frac{7b}{10}$ **$\frac{15a}{7}$**

54. $\frac{7mn}{8} \div \frac{3m}{4}$ **$\frac{7n}{6}$**

55. Pilar drinks $1\frac{3}{4}$ glasses of milk each day. At this rate, how many days will it take her to drink a total of 14 glasses? **8 days**

56. Tahn plants $6\frac{1}{2}$ flats of tomatoes in a row. How many rows will she need to plant 52 flats? **8 rows**

Example 7

Find the multiplicative inverse of $2\frac{3}{4}$.

$2\frac{3}{4} = \frac{11}{4}$ Rename $2\frac{3}{4}$ as an improper fraction.

$\frac{11}{4} \cdot \frac{4}{11} = 1$ The product is 1.

The multiplicative inverse of $2\frac{3}{4}$ is $\frac{4}{11}$.

Example 8

Find $\frac{4}{9} \div \frac{2}{15}$. Write in simplest form.

$\frac{4}{9} \div \frac{2}{15} = \frac{4}{9} \cdot \frac{15}{2}$ Multiply by the reciprocal of $\frac{2}{15}$, $\frac{15}{2}$.

$= \frac{\overset{2}{\cancel{4}}}{\underset{3}{\cancel{9}}} \cdot \frac{\overset{5}{\cancel{15}}}{\underset{1}{\cancel{2}}}$ Divide out common factors.

$= \frac{10}{3}$ or $3\frac{1}{3}$ Simplify.

Example 9

Find $\frac{cd}{4} \div \frac{d}{20}$. Write in simplest form.

$\frac{cd}{4} \div \frac{d}{20} = \frac{cd}{4} \cdot \frac{20}{d}$ Multiply by the reciprocal.

$= \frac{\overset{1}{\cancel{cd}}}{\underset{1}{\cancel{4}}} \cdot \frac{\overset{5}{\cancel{20}}}{\underset{1}{\cancel{d}}}$ Divide out common factors.

$= \frac{5c}{1}$ or $5c$ Simplify.

Find each sum or difference. Write in simplest form.

57. $\frac{8}{15} + \left(-\frac{2}{15}\right)$ **$\frac{2}{5}$**   **58.** $\frac{6}{12} - \frac{11}{12}$ **$-\frac{5}{12}$**

59. $\frac{3}{7} - \left(-\frac{2}{7}\right)$ **$\frac{5}{7}$**   **60.** $-\frac{1}{3} - \left(-\frac{1}{3}\right)$ **0**

61. $2\frac{5}{12} - \left(-8\frac{7}{12}\right)$ **11**   **62.** $5\frac{3}{7} + 2\frac{6}{7}$ **$8\frac{2}{7}$**

63. Samantha is going to walk $3\frac{5}{16}$ miles today and $2\frac{3}{16}$ miles tomorrow. What is the total distance she will walk? **$5\frac{1}{2}$ mi**

64. Last week, Douglas fed his puppy $10\frac{1}{4}$ cups of food. This week, the puppy will be fed an additional $1\frac{1}{4}$ cups of food. Find the total amount of food the puppy will be fed this week. **$11\frac{1}{2}$ c**

65. Harry's sunflowers have grown to be $8\frac{1}{4}$ feet tall. Sonya's sunflowers are $6\frac{3}{4}$ feet tall. How much taller are Harry's flowers? **$1\frac{1}{2}$ ft**

66. Last month Clarissa read $41\frac{3}{8}$ books for the Read-a-thon. Mona read $27\frac{5}{8}$ books. How many more books did Clarissa read? **$13\frac{3}{4}$ books**

Example 10

Find $\frac{3}{4} - \left(-\frac{3}{4}\right)$. Write in simplest form.

$\frac{3}{4} - \left(-\frac{3}{4}\right) = \frac{3}{4} + \frac{3}{4}$ To subtract $-\frac{3}{4}$, add $\frac{3}{4}$.

$= \frac{3+3}{4}$ The denominators are the same. Add the numerators.

$= \frac{6}{4}$ Simplify.

$= 1\frac{1}{2}$ Simplify.

Example 11

Find $5\frac{7}{8} - 8\frac{3}{8}$. Write in simplest form.

$5\frac{7}{8} - 8\frac{3}{8} = \frac{47}{8} - \frac{67}{8}$ Write the mixed numbers as improper fractions.

$= \frac{47-67}{8}$ Subtract the numerators.

$= \frac{-20}{8}$ Simplify the numerator.

$= -\frac{5}{2}$ or $-2\frac{1}{2}$ Simplify.

Find each sum or difference. Write in simplest form.

67. $\frac{2}{5} + \frac{1}{15}$ **$\frac{7}{15}$**   **68.** $-3\frac{5}{6} - 2\frac{1}{2}$ **$-6\frac{1}{3}$**

69. $\frac{4}{7} + \left(-1\frac{1}{3}\right)$ **$-\frac{16}{21}$**   **70.** $\frac{3}{10} - \left(-\frac{1}{8}\right)$ **$\frac{17}{40}$**

71. $25\frac{1}{3} - 14\frac{2}{5}$ **$10\frac{14}{15}$**   **72.** $7\frac{3}{4} + 1\frac{3}{8}$ **$9\frac{1}{8}$**

73. $-\frac{5}{9} - 3\frac{2}{3}$ **$-4\frac{2}{9}$**   **74.** $-4\frac{1}{6} + \frac{3}{4}$ **$-3\frac{5}{12}$**

75. Monica needs $2\frac{3}{4}$ cups of flour for a batch of cookies and $3\frac{1}{3}$ cups of flour for a dozen muffins. How many cups of flour does Monica need altogether? **$6\frac{1}{12}$ c**

76. Dane and his family drove 357.9 miles in one day. If their trip is a total of $524\frac{3}{4}$ miles, how much farther do they need to drive? **$166\frac{17}{20}$ mi or 166.85 mi**

77. Ricardo swam 75.5 meters in the school pool. Helen swam $93\frac{3}{4}$ meters the same day. How much further did Helen swim that day? **$18\frac{1}{4}$ m**

Example 12

Find $-\frac{3}{8} + \frac{5}{6}$. Write in simplest form.

$-\frac{3}{8} + \frac{5}{6} = -\frac{3}{8} \cdot \frac{3}{3} + \frac{5}{6} \cdot \frac{4}{4}$ The LCD is 24. Rename the fractions using the LCD.

$= -\frac{9}{24} + \frac{20}{24}$ Simplify.

$= \frac{-9+20}{24}$ Add the numerators.

$= \frac{11}{24}$ Simplify.

Example 13

Find $6\frac{5}{9} - 4\frac{11}{12}$. Write in simplest form.

$6\frac{5}{9} - 4\frac{11}{12} = 6\frac{20}{36} - 4\frac{33}{36}$ The LCD is 36. Rename the fractions using the LCD.

$= 5\frac{56}{36} - 4\frac{33}{36}$ Since $\frac{20}{36}$ is less than $\frac{33}{36}$, rename $6\frac{20}{36}$.

$= 1\frac{23}{36}$ Subtract the whole numbers and then the fractions.