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1-2 Divisibility Patterns (pages 10–13)

When you divide a whole number by another whole number, and the quotient is a whole number, then the first number is divisible by the second. For example, 12 is divisible by 2 because the quotient 12 ÷ 2 is 6. You can test for divisibility mentally by using the divisibility rules below.

Divisibility Rules for 2, 3, 4, 5, 6, 9, 10	A number is divisible by: • 2 if the ones digit is divisible by 2. • 3 if the sum of the digits is divisible by 3. • 4 if the number formed by the last two digits is divisible by 4. • 5 if the ones digit is 0 or 5. • 6 if the number is divisible by both 2 and 3. • 9 if the sum of the digits is divisible by 9. • 10 if the ones digit is 0.

EXAMPLES

A Is 34 divisible by 2?

The ones digit is 4. Since 4 ÷ 2 = 2, 4 is divisible by 2. So, 34 is divisible by 2.

B Is 52 divisible by 3?

The sum of the digits is 5 + 2, or 7. Since 7 is not divisible by 3, 52 is not divisible by 3.

Try These Together

1. Is 70 divisible by 5?

HINT: Is the ones digit 0 or 5?

2. Is 208 divisible by 9?

HINT: Is the sum of the digits divisible by 9?

PRACTICE

Tell whether the first number is divisible by the second number.

3. 984; 2 **4.** 533; 4 **5.** 935; 5

6. 570; 3 **7.** 2,861; 2 **8.** 626; 6

9. 5,650; 10 **10.** 8,844; 6 **11.** 77,787; 9

Tell whether each number is divisible by 2, 3, 4, 5, 6, 9, or 10.

12. 365 **13.** 1,170 **14.** 887

15. 486 **16.** 620 **17.** 2,865

18. 350 **19.** 4,544 **20.** 51

21. Design The fourth grade class at Chavez Elementary School is having a group photo taken. There are 102 students in the fourth grade. Can they form 6 equal rows for the photo?

22. Standardized Test Practice Which number is divisible by both 2 and 9?

A 5,148 **B** 5,618 **C** 8,364 **D** 9,782

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3-2 Comparing and Ordering Decimals (pages 108–110)

You can compare decimals by comparing the digits in each place-value position or by placing the decimals on a number line. Recall that $<$ means *less than* and $>$ means *greater than*.

Comparing Decimals	Line up the decimal points of the two numbers you want to compare. Then starting at the left, compare the digits in the same place-value position. When you come to a place where the digits are not equal, the decimal with the greater digit is the greater decimal number. On a number line, numbers to the right are greater than numbers to the left.

EXAMPLES

A Which number is greater, 1.09 or 1.9?

1.09
1.9

The digits are the same in the ones place but the second number has a greater digit in the tenths place, so 1.9 is the greater number.
1.9 > 1.09

B Order 21.98, 24.03, 2.4, and 2.198 from least to greatest.

21.98
24.03
2.4
2.198

2.198, 2.4, 21.98, 24.03

Try These Together

1. Which of these numbers is to the left of 4.5 on a number line: 40.5 or 4.05?

HINT: Which number is less than 4.5?

2. Order 0.01, 0.002, and 0.02 from greatest to least.

HINT: You can also look at hundredths as money. Which is greater, 2 cents or 1 cent?

PRACTICE

Use >, <, or = to compare each pair of decimals.

3. 0.41 ● 0.45 **4.** 1.8 ● 1.80 **5.** 8.25 ● 8.31

6. 46.85 ● 46.96 **7.** 0.06 ● 0.61 **8.** 0.78 ● 0.45

9. 1.363 ● 1.367 **10.** 458.6 ● 458.4 **11.** 1.03 ● 1.01

Order each set of decimals from least to greatest.

12. 12.56, 12.58, 12.36, 12.41 **13.** 456.9, 455.8, 455.4, 456.3

14. Which is the greatest, 5.06, 5.60, or 5.006?

15. **Standardized Test Practice** Which of these numbers is the smallest: 4.015, 4.014, 4.018, or 4.011?

A 4.011 **B** 4.014 **C** 4.018 **D** 4.015

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3-3 Rounding Decimals (pages 111–113)

You can round decimals to any place-value position.

Rounding Decimals	• Underline the digit to be rounded. • Look at the digit to the right of the place being rounded. • Leave the underlined digit the same if the digit to the right is 0, 1, 2, 3, or 4. • Round up by adding 1 to the underlined digit if the digit to the right is 5, 6, 7, 8, or 9. • Then drop all the digits to the right of the underlined digit.

EXAMPLES

A Round 25.0743 to the nearest tenth.

Underline the digit in the tenths place (0). Look at the digit to the right (7). Since 7 is greater than 5, add one to the 0. Then drop all the digits to the right. 25.1

B Round 324.67 to the nearest ten.

Underline the digit in the tens place (2). Because the next digit to the right is less than 5, leave the 2 the same. Replace the 4 with a 0 to keep the digits to the left of the decimal in the proper places. Drop the digits to the right of the decimal. 320

Try These Together

1. Round \$6.50 to the nearest dollar.
   HINT: Remember that with a 5 you round up.

2. Is 0.345 closer to 0.3 or 0.4?
   HINT: Use zeros to write each number with the same number of decimal places.

PRACTICE

Round each decimal to the indicated place-value position.

3. 1.21; tenths
4. 8.63; ones
5. 38.622; hundredths
6. 4.37; tenths
7. 24.8568; thousandths
8. 27.53; ones
9. 13.58; tenths
10. 23.2594; thousandths
11. 99.3482; thousandths
12. 95.524; hundredths
13. 9.64; tenths
14. 87.635; hundredths

15. Round 67.687 to the nearest tenth.
16. Round \$12.35 to the nearest dollar.
17. **Entertainment** It costs \$3.99 to rent a movie from the video store. If you rented a movie, how much would you probably say it cost? (Round \$3.99 to the nearest dollar.)

18. **Standardized Test Practice** People in the United States are living longer than ever before. The average life span is 76.1 years. What is this number rounded to the nearest year?

A 77 **B** 76.2 **C** 76.1 **D** 76

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3-5 Adding and Subtracting Decimals

(pages 121–124)

You add and subtract decimals the same way you do whole numbers, after you line up the decimal points.

Adding and Subtracting Decimals	• Write the numbers you want to add or subtract so that the decimal points are in a line. Add zeros if they are needed. • Estimate the sum or difference so you can check to see if your final answer is reasonable. • Add or subtract. Compare the result with your estimate.

EXAMPLES

A Find the sum of 2.45 and 30.7.

Line up the decimal points and add a zero.

2.45	*Estimate first.*
+ 30.70	*This is about 31 + 2 or 33.*
33.15	*This is reasonably close to the estimate of 33.*

B Subtract 27.8 from 60.

Line up the decimal points and add a zero.

60.0	*Estimate first.*
− 27.8	*This is about 60 − 30 or 30.*
32.2	*This is reasonably close to the estimate of 30.*

Try These Together

1. Subtract 3 − 2.09.
   HINT: Remember that 3 is the same as 3.00

2. Add 4.56 + 23.
   HINT: Rewrite 23 with a decimal point and two zeros as you line up the numbers to add.

PRACTICE

Add or subtract.

3. 5.6 + 4.2
4. 1.25 + 1.34
5. 12.61 + 3.27
6. 25.69 − 24.54
7. 2.7 − 1.1
8. 13.32 − 9.12
9. $10.26 − $8.28
10. 5.68 + 3.45
11. 9 + 3.43
12. 4.05 + 2.68
13. 16.51 − 13.25
14. 0.06 + 0.15

15. What is the value of $c + d$ if $c = 22.4$ and $d = 36.2$?
16. Evaluate $q - r$ if $q = 3.5$ and $r = 2.1$.
17. **Surveys** Manuel surveyed two of his friends to find out the average number of sodas they drink in one week. Carl drinks 4.5 sodas and Jon drinks 6.75 sodas. How many sodas do Carl and Jon drink together in one week?

18. **Standardized Test Practice** Janette is 1.55 meters tall and Kirsten is 1.47 meters tall. How much taller is Janette than Kirsten?

A 0.08 m **B** 0.06 m **C** 0.07 m **D** 0.09 m

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4-1 Multiplying Decimals by Whole Numbers (pages 135–138)

When you multiply a decimal by a whole number, you can estimate to find where to put the decimal point in the product. You can also place the decimal point by counting the decimal places in the decimal factor.

Estimation	• Estimate the product of a decimal and a whole number by rounding the decimal to its greatest place value position and then multiplying. • Multiply as you do with whole numbers. • Use your estimate as a guide for placing the decimal in the product.
Counting Decimal Places	• Multiply the decimal and whole number as if they were both whole numbers. • Count the number of decimal places in the decimal factor. Place the decimal point in the answer so that there are the same number of decimal places as in the decimal factor. Annex (or write) zeros to the left of your answer if more decimal places are needed.

EXAMPLES

Find the value of each expression.

A Find 22.3×5.

20×5 Round the decimal. Estimate the product; 100.

$$\begin{array}{r} 22.3 \\ \times\ \ 5 \\ \hline 111.5 \end{array}$$

Multiply as with whole numbers.

Use the estimate, 100, as a guide to placing the decimal. Place the decimal point after 111.

B Find 0.015×3.

$$\begin{array}{r} 0.015 \\ \times\ \ 3 \\ \hline 0.045 \end{array}$$

There are 3 decimal places in this factor.

Annex a zero on the left to make three decimal places.

Try These Together

Multiply.

1. $\begin{array}{r} 4.02 \\ \times\ \ 5 \end{array}$

HINT: Estimate the product; then, multiply as with whole numbers.

2. $\begin{array}{r} 0.017 \\ \times\ \ 2 \end{array}$

HINT: Count the decimal places in the decimal factor.

PRACTICE

Multiply.

3. $\begin{array}{r} 0.4 \\ \times\ 9 \end{array}$

4. $\begin{array}{r} 0.62 \\ \times\ 7 \end{array}$

5. $\begin{array}{r} 1.71 \\ \times\ 3 \end{array}$

6. $\begin{array}{r} 3.65 \\ \times\ 5 \end{array}$

7. 61×0.004

8. 9.7×561

9. $5{,}618 \times 6.83$

10. **Standardized Test Practice** Evaluate $104h$ if $h = 7.1$.

A 0.7384 **B** 738.4 **C** 7,384 **D** 73,840

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4-2 Multiplying Decimals (pages 141–143)

When you multiply two decimals, multiply as with whole numbers. To place the decimal point, find the sum of the number of decimal places in each factor. The product has the same number of decimal places.

EXAMPLES

Find the value of each expression.

A Find 2.9×4.1.

3×4 Round the decimals. Estimate the product; 12.

$$\begin{array}{r} 2.9 \\ \times\ 4.1 \\ \hline 29 \\ 116 \\ \hline 11.89 \end{array}$$

one decimal place
one decimal place
two decimal places

The product is 11.89. Compared to the estimate, the product is reasonable.

B Find 3.2×5.7.

3×6 Round the decimals. Estimate the product; 18.

$$\begin{array}{r} 3.2 \\ \times\ 5.7 \\ \hline 224 \\ 160 \\ \hline 18.24 \end{array}$$

one decimal place
one decimal place
two decimal places

The product is 18.24. Compared to the estimate, the product is reasonable.

Try These Together

Multiply.

1. $\begin{array}{r} 7.6 \\ \times\ 2.3 \\ \hline \end{array}$

HINT: Estimate the product. Then multiply as with whole numbers.

2. $\begin{array}{r} 0.52 \\ \times\ 2.6 \\ \hline \end{array}$

HINT: Count the decimal places in the factors.

PRACTICE

Multiply.

3. 0.52×1.7

4. 6.6×0.054

5. 2.73×5.86

6. 1.5×6.4

7. 0.9×0.036

8. 3.25×7.3

9. 0.85×0.04

10. 4.6×8.2

11. 12.6×2.7

12. Find $2.5a + b$ if $a = 4.65$ and $b = 5.8$

13. **Standardized Test Practice** Multiply 1.6×0.023.

A 0.0368 **B** 0.368 **C** 3.68 **D** 36.8

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4-3 Dividing Decimals by Whole Numbers (pages 144–147)

When you divide a decimal by a whole number, place the decimal point in the quotient directly above the decimal point in the dividend. Then, divide as you do with whole numbers.

EXAMPLES

Find each quotient.

A $14.8 \div 2$

First estimate: $14 \div 2 = 7$.

$$\begin{array}{r} 7.4 \\ 2\overline{)14.8} \\ -14 \\ \hline 8 \\ -8 \\ \hline 0 \end{array}$$

Place the decimal point.

Divide as with whole numbers.

B $27.3 \div 3$

First estimate: $27 \div 3 = 9$.

$$\begin{array}{r} 9.1 \\ 3\overline{)27.3} \\ -27 \\ \hline 3 \\ -3 \\ \hline 0 \end{array}$$

Place the decimal point.

Divide as with whole numbers.

Try These Together

Find each quotient.

1. $25.4 \div 2$

HINT: Use the dividend as a guide to placing the decimal in the quotient.

2. $6.16 \div 4$

HINT: Use the dividend as a guide to placing the decimal in the quotient.

PRACTICE

Divide. Round to the nearest tenth if necessary.

3. $7\overline{)29.4}$
4. $12\overline{)915.96}$
5. $31\overline{)570.4}$
6. $155.1 \div 66$
7. $17\overline{)152.83}$
8. $42\overline{)68.46}$
9. $81.81 \div 27$
10. $41.79 \div 86$
11. $21\overline{)698.44}$
12. $69\overline{)73.67}$
13. $58.42 \div 16$
14. $247.73 \div 44$
15. $104.745 \div 34$
16. $65\overline{)623.86}$
17. $91\overline{)5.237}$
18. $24.15 \div 7$
19. $1.507 \div 11$
20. $144.96 \div 48$

21. **Money Matters** Mika borrowed $18.30 from his parents to buy a book. How much should Mika give his parents each week if he plans to make equal payments for six weeks?

22. **Standardized Test Practice** Round $126.33 \div 16$ to the nearest hundredth.

A 7.8 **B** 7.89 **C** 7.90 **D** 7.93

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5-1 Greatest Common Factor (pages 177–180)

Two or more numbers may both have the same factor, called a common factor. The greatest of the common factors of two or more numbers is called the **greatest common factor** (GCF) of the numbers. There are two methods you can use to find the GCF of two or more numbers.

Method 1: Listing Factors	• List all of the factors of each number. • Identify the common factors. • The greatest of the common factors is the GCF.
Method 2: Use Prime Factors	• Write the prime factorization of each number • Identify all of the common prime factors. • The product of the common prime factors is the GCF.

EXAMPLES

A Find the GCF of 15 and 18.

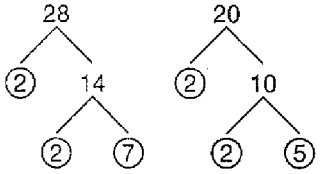
Make a list of the factors of each number.

factors of 15: ***1, 3,*** *5, 15*
factors of 18: ***1,*** *2,* ***3,*** *6, 9, 18*

The common factors are 1 and 3.
The GCF of 15 and 18 is 3.

B Find the GCF of 20 and 28.

Write the prime factorization of each number.



The common prime factors are 2 and 2. The GCF of 20 and 28 is 2 × 2, or 4.

Try These Together

1. Find the GCF of 14 and 28.
   HINT: Make a list of factors.

2. Find the GCF of 32 and 44.
   HINT: Use factor trees to find the common prime factors.

PRACTICE

Find the GCF of each set of numbers.

3. 7, 42	**4.** 10, 36	**5.** 44, 66
6. 30, 35	**7.** 4, 12, 28	**8.** 26, 52, 91
9. 62, 93	**10.** 59, 118	**11.** 25, 75
12. 30, 33	**13.** 14, 18, 22	**14.** 38, 57, 114

15. Sales Anton has made 24 gingersnaps, 60 peanut butter cookies, and 84 sugar cookies for a bake sale. What is the greatest number of boxes that he can pack them in so that the boxes contain the same number and types of cookies?

16. **Standardized Test Practice** What is the GCF of 40 and 72?

A 2 **B** 4 **C** 8 **D** 16

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5-2 Simplifying Fractions (pages 182–185)

You can write the fraction $\frac{2}{4}$ as $\frac{1}{2}$ and also as $\frac{4}{8}$. These fractions are **equivalent fractions**, because they name the same number. Use equivalent fractions to write fractions in **simplest form**. A fraction is in simplest form when the GCF of the numerator and denominator is 1.

Finding Equivalent Fractions	 Two out of four, or $\frac{2}{4}$ of the parts of the rectangle are shaded.  One out of two, or $\frac{1}{2}$ of the parts of the rectangle is shaded. The rectangles are the same size, and the same amount of each is shaded, so the fractions are equivalent.	
	$\frac{2}{4} \overset{\div 2}{=} \frac{1}{2}$ $\quad \frac{1}{2} \overset{\times 2}{=} \frac{2}{4}$	Multiply or divide both the numerator and the denominator of a fraction by the same nonzero number.

EXAMPLES

Replace each ■ with a number so that the fractions are equivalent.

A $\frac{2}{3} = \frac{6}{■}$

Since 2 × 3 = 6, multiply the denominator also by 3.

$\frac{2}{3} = \frac{6}{9}$

B $\frac{15}{20} = \frac{■}{4}$

Since 20 ÷ 5 = 4, divide the numerator also by 5.

$\frac{15}{20} = \frac{3}{4}$

Try These Together

1. $\frac{5}{6} = \frac{20}{■}$

HINT: Multiply the numerator and denominator by the same number.

2. Write $\frac{10}{12}$ in simplest form.

HINT: The GCF of the numerator and denominator must be 1.

PRACTICE

Replace each ■ with a number so that the fractions are equivalent.

3. $\frac{2}{3} = \frac{18}{■}$ **4.** $\frac{8}{24} = \frac{■}{3}$ **5.** $\frac{5}{6} = \frac{30}{■}$

6. **Standardized Test Practice** What is $\frac{27}{30}$ in simplest form?

A $\frac{2}{3}$ **B** $\frac{9}{15}$ **C** $\frac{22}{24}$ **D** $\frac{9}{10}$

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5-3 Mixed Numbers and Improper Fractions (pages 186–189)

A **mixed number** shows the sum of a whole number and a fraction. For example, $2\frac{5}{6}$ is a mixed number that means $2 + \frac{5}{6}$. A fraction such as $\frac{8}{7}$, where the numerator is greater than or equal to the denominator, is known as an **improper fraction**. You can rewrite a mixed number as an improper fraction.

Writing Mixed Numbers as Improper Fractions	To write a mixed number as an improper fraction, first multiply the whole number by the denominator and add the numerator. Write this sum over the denominator. $2\frac{1}{8} = \frac{(2 \times 8) + 1}{8} = \frac{17}{8}$
Writing Improper Fractions as Mixed Numbers	Express $\frac{5}{3}$ as a mixed number. Divide the numerator by the denominator. $3\overline{)5}$ R 2 (1) -3 2 Write the remainder in the numerator of a fraction that has the divisor as the denominator. So $\frac{5}{3} = 1\frac{2}{3}$.

EXAMPLES

A Write $3\frac{2}{3}$ as an improper fraction.

$3\frac{2}{3} = \frac{(3 \times 3) + 2}{3} = \frac{11}{3}$ *Multiply 3 by 3 and add 2. Write the result over 3.*

B Write $\frac{8}{7}$ as a mixed number.

8 ÷ 7 = 1 R1 Write the remainder in the numerator of a fraction that has the divisor as the denominator.

$\frac{8}{7} = 1\frac{1}{7}$

PRACTICE

Write each mixed number as an improper fraction.

1. $4\frac{1}{7}$
2. $10\frac{2}{5}$
3. $3\frac{1}{2}$
4. $5\frac{5}{9}$

Write each improper fraction as a mixed number.

5. $\frac{11}{2}$
6. $\frac{16}{5}$
7. $\frac{23}{8}$
8. $\frac{25}{3}$

9. **Standardized Test Practice** Write two and two-ninths as an improper fraction.

A $\frac{22}{9}$ **B** $\frac{20}{9}$ **C** $\frac{18}{9}$ **D** $\frac{12}{9}$

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5-4 Least Common Multiple (pages 194–197)

A **multiple** of a number is the product of that number and any whole number. Two different numbers can share some of the same multiples. These are called **common multiples**. The least of the common multiples of two or more numbers, other than zero, is called the **least common multiple (LCM)**. Use the following methods to find the LCM.

Method 1: Make a List	• List the nonzero multiples of each number. • Identify the LCM from the common multiples.
Method 2: Use Prime Factors	• Write the prime factorization for each number. • Identify all common prime factors. Then find the product of the common prime factors using each common factor only once, and multiply by any remaining prime factors. This product is the LCM.

EXAMPLES

A Find the LCM of 4 and 6 by making a list.

*multiples of 4: 4, 8, **12**, 16, 20, **24***

*multiples of 6: 6, **12**, 18, **24**, 30*

The LCM of 4 and 6 is 12.

B Find the LCM of 10 and 12.

Use prime factorization.

$10 = (2) \times 5$

$12 = (2) \times 2 \times 3$

The LCM is $2 \times 2 \times 3 \times 5$, or 60.

Try These Together

1. Find the LCM of 6 and 8.
   HINT: List the nonzero multiples of each number.

2. Find the LCM of 8 and 10.
   HINT: Use prime factorization. Use common prime factors only once.

PRACTICE

Find the LCM of each set of numbers.

3. 2 and 7	**4.** 8 and 12	**5.** 25 and 30	**6.** 6 and 21
7. 3 and 8	**8.** 8 and 18	**9.** 4 and 10	**10.** 15 and 35
11. 7 and 14	**12.** 3 and 5	**13.** 4 and 9	**14.** 4 and 22
15. 20 and 45	**16.** 2, 9, and 15	**17.** 3, 15, and 45	**18.** 10, 30, and 65

19. Design Ingrid is stringing 3 bracelets, one with 4 mm beads, one with 5 mm beads, and one with 6 mm beads. What is the shortest length where all the bracelets are equal?

20. **Standardized Test Practice** Find the LCM of 5, 6, and 45.

A 45 **B** 60 **C** 90 **D** 135

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6-3 Adding and Subtracting Fractions with Like Denominators (pages 228–231)

Fractions with the same denominator are **like fractions**. You add and subtract the numerators of like fractions the same way you add and subtract whole numbers.

Adding Like Fractions	• To add fractions with like denominators, add the numerators. Use the same denominator in the sum.
Subtracting Like Fractions	• To subtract fractions with like denominators, subtract the numerators. Use the same denominator in the difference.

EXAMPLES

A Find the sum of $\frac{1}{7}$ and $\frac{3}{7}$.

Estimate. $0 + \frac{1}{2} = \frac{1}{2}$

$\frac{1}{7} + \frac{3}{7} = \frac{1+3}{7}$

$= \frac{4}{7}$ *Compared to the estimate, the answer is reasonable.*

B Find the difference $\frac{3}{4} - \frac{1}{4}$.

Estimate. $1 - \frac{1}{2} = \frac{1}{2}$

$\frac{3}{4} - \frac{1}{4} = \frac{3-1}{4}$

$= \frac{2}{4}$ *or* $\frac{1}{2}$ *Compared to the estimate, the answer is reasonable.*

Try These Together

Add or subtract. Write in simplest form.

1. $\frac{2}{3} + \frac{2}{3}$

HINT: Add the numerators. Write the sum as a mixed number.

2. $\frac{5}{8} - \frac{3}{8}$

HINT: Subtract the numerators. Write the answer in simplest form.

PRACTICE

Add or subtract. Write in simplest form.

3. $\frac{1}{3} + \frac{2}{3}$

4. $\frac{4}{5} + \frac{2}{5}$

5. $\frac{7}{16} - \frac{3}{16}$

6. $\frac{9}{10} - \frac{3}{10}$

7. $\frac{2}{7} + \frac{3}{7}$

8. $\frac{9}{15} - \frac{6}{15}$

9. How much larger is $\frac{7}{8}$ than $\frac{3}{8}$?

10. Find the sum of $\frac{1}{8}$, $\frac{3}{8}$, and $\frac{5}{8}$.

11. **Standardized Test Practice** Find the following total. $\left(\frac{11}{16} + \frac{5}{16}\right) - \left(\frac{3}{16} + \frac{8}{16}\right)$

A $\frac{7}{16}$ **B** $\frac{1}{2}$ **C** $\frac{5}{16}$ **D** $1\frac{3}{16}$

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6-5 Adding and Subtracting Mixed Numbers (pages 240–243)

Use the following rules to add and subtract mixed numbers.

Adding and Subtracting Mixed Numbers	• Add or subtract the fractions. • Then add or subtract the whole numbers. • Rename and simplify if necessary.

EXAMPLES

A Find $5\frac{5}{8} + 1\frac{1}{8}$.

Add the fractions. *Add the whole numbers.*

$$5\tfrac{5}{8} \qquad 5\tfrac{5}{8}$$
$$+1\tfrac{1}{8} \rightarrow +1\tfrac{1}{8}$$
$$\tfrac{6}{8} \qquad 6\tfrac{6}{8} \text{ or } 6\tfrac{3}{4}$$

Simplify.

B Find $3\frac{5}{6} - 2\frac{1}{2}$.

Subtract the fractions. *Subtract the whole numbers.*

$$3\tfrac{5}{6} \qquad 3\tfrac{5}{6} \qquad 3\tfrac{5}{6}$$
$$-2\tfrac{1}{2} \rightarrow -2\tfrac{3}{6} \rightarrow -2\tfrac{3}{6}$$
$$\tfrac{2}{6} \qquad 1\tfrac{2}{6} \text{ or } 1\tfrac{1}{3}$$

Simplify.

Try These Together

Add or subtract. Write in simplest form.

1. $7\frac{1}{4} + 10\frac{1}{2}$

HINT: Rename the fractions. Add the fractions. Then add the whole numbers.

2. $9\frac{11}{12} - 4\frac{3}{8}$

HINT: Rename the fractions. Subtract the fractions. Then subtract the whole numbers.

PRACTICE

Add or subtract. Write in simplest form.

3. $2\frac{1}{3} + 5\frac{3}{8}$

4. $9\frac{3}{5} - 2\frac{3}{15}$

5. $5\frac{2}{3} + 3\frac{1}{2}$

6. $8\frac{1}{3} - 6\frac{1}{4}$

7. $15\frac{7}{8} - 12\frac{3}{4}$

8. $8\frac{5}{12} - 2\frac{1}{8}$

9. $1\frac{7}{10} + 4\frac{1}{3}$

10. $9\frac{1}{3} + 5\frac{5}{6}$

11. $4\frac{3}{4} - 2\frac{2}{3}$

12. **Standardized Test Practice** A bag of potatoes weighs $5\frac{3}{4}$ pounds. At the first meal, $1\frac{1}{3}$ pounds of potatoes are eaten. At a later meal, $2\frac{1}{4}$ pounds of potatoes are eaten. How many pounds of potatoes remain in the bag?

A $2\frac{1}{6}$ **B** $2\frac{1}{3}$ **C** $1\frac{5}{6}$ **D** $2\frac{2}{3}$

NAME _____ DATE _____ PERIOD _____

6-4 Adding and Subtracting Fractions with Unlike Denominators (pages 235–238)

When you add or subtract fractions, the fractions must have the same denominators. To add or subtract fractions with unlike denominators, rename the fractions using the least common denominator (LCD). Then add or subtract and simplify.

EXAMPLES

A Add $\frac{1}{2}$ and $\frac{2}{3}$.

The LCD of $\frac{1}{2}$ and $\frac{2}{3}$ is 6.

$\frac{1}{2} = \frac{3}{6}$ (×3), and $\frac{2}{3} = \frac{4}{6}$ (×2) *Rename the fractions.*

$\frac{3}{6} + \frac{4}{6} = \frac{7}{6}$, or $1\frac{1}{6}$ *Add, then simplify.*

B Find $\frac{3}{5} - \frac{1}{4}$.

The LCD of $\frac{3}{5}$ and $\frac{1}{4}$ is 20.

$\frac{3}{5} = \frac{12}{20}$ (×4), and $\frac{1}{4} = \frac{5}{20}$ (×5) *Rename the fractions.*

$\frac{12}{20} - \frac{5}{20} = \frac{7}{20}$ *Subtract.*

Try These Together

Add or subtract. Write in simplest form.

1. $\frac{3}{4} - \frac{1}{6}$

HINT: Find the LCD, then rename the fractions.

2. $\frac{3}{8} + \frac{5}{12}$

HINT: Find the LCD, then rename the fractions.

PRACTICE

Add or subtract. Write in simplest form.

3. $\frac{3}{8} + \frac{1}{4}$
4. $\frac{2}{3} + \frac{1}{6}$
5. $\frac{7}{8} + \frac{1}{2}$
6. $\frac{2}{5} + \frac{1}{3}$
7. $\frac{11}{12} + \frac{5}{6}$
8. $\frac{1}{6} + \frac{3}{4}$
9. $\frac{3}{7} + \frac{1}{2}$
10. $\frac{8}{11} - \frac{2}{3}$
11. $\frac{4}{9} - \frac{1}{6}$
12. What is the sum of $\frac{5}{8}$ and $\frac{9}{16}$?
13. How much is $\frac{9}{10} - \frac{2}{5}$?
14. How much more is $\frac{11}{16}$ than $\frac{1}{4}$?
15. **Carpentry** You are building a bookcase. The board that makes up the side of the bookcase is $\frac{1}{2}$ inch thick. If you use $\frac{7}{8}$-inch screws to attach the shelves of the bookcase, how far into the shelves do the screws extend?

16. **Standardized Test Practice** What is the sum of $\frac{1}{6}$, $\frac{3}{4}$, and $\frac{9}{12}$?

A $\frac{7}{12}$ **B** $\frac{11}{12}$ **C** $1\frac{5}{12}$ **D** $1\frac{2}{3}$