LESSON

1 Adding Whole Numbers and Money • Subtracting Whole Numbers and Money • Fact Families, Part 1

WARM-UP†

Facts Practice: 64 Addition Facts (Test A)

Mental Math: Count by 10's from 10 to 100 and from 100 to 0. Count by 100's from 100 to 1000 and from 1000 to 0.

a. 30 + 30	**b.** 300 + 300	**c.** 80 + 40
d. 800 + 400	**e.** 20 + 30 + 40	**f.** 200 + 300 + 400

Problem Solving:

Sam thought of a number between ten and twenty. Then he gave a clue: You say the number when you count by twos and when you count by threes, but not when you count by fours. Of what number was Sam thinking?

NEW CONCEPTS

Adding whole numbers and money

To combine two or more numbers, we add. The numbers that are added together are called **addends.** The answer is called the **sum.** Changing the order of the addends does not change the sum. For example,

$$3 + 5 = 5 + 3$$

This property of addition is called the **commutative property.**

When adding numbers, we add digits that have the same place value.

Example 1 Add: 345 + 67

Solution When we add whole numbers on paper, we write the numbers so that the place values are aligned. Then we add the digits by column.

$$\begin{array}{rr} {\scriptstyle 1\,1} & \\ 345 & \text{addend} \\ +\ 67 & \text{addend} \\ \hline \mathbf{412} & \text{sum} \end{array}$$

Changing the order of the addends does not change the sum. One way to check an addition answer is to change the order of the addends and add again.

$$\begin{array}{rr} {\scriptstyle 1\,1} & \\ 67 & \\ +\ 345 & \\ \hline \mathbf{412} & \text{check} \end{array}$$

†For instructions on how to use the Warm-up, please consult the preface.

Example 2 Add: \$1.25 + \$12.50 + \$5

Solution When we add money, we write the numbers so that the decimal points are aligned. We write \$5 as \$5.00 and add the digits in each column.

$$\begin{array}{r} \$1.25 \\ \$12.50 \\ +\ \$5.00 \\ \hline \mathbf{\$18.75} \end{array}$$

If one of two addends is zero, the sum of the addends is identical to the nonzero addend. This property of addition is called the **identity property of addition.**

$$5 + 0 = 5$$

Subtracting whole numbers and money

We subtract one number from another number to find the **difference** between the two numbers. In a subtraction problem, the **subtrahend** is taken from the **minuend.**

$$5 - 3 = 2$$

In the problem above, 5 is the minuend and 3 is the subtrahend. The difference between 5 and 3 is 2.

The commutative property does not apply to subtraction; for example, $2 - 4$ does not equal $4 - 2$.

Example 3 Subtract: $345 - 67$

Solution When we subtract whole numbers, we align the digits by place value. We subtract the bottom number from the top number and regroup when necessary.

$$\begin{array}{r} {}^{2}\not{3}\,{}^{13}\not{4}\,{}^{1}5 \\ -\ \ 6\ 7 \\ \hline \mathbf{2\ 7\ 8} \end{array} \quad \text{difference}$$

Example 4 Jim spent \$1.25 for a hamburger. He paid for it with a five-dollar bill. Find how much change he should get back by subtracting \$1.25 from \$5.

Solution Order matters when we subtract. The starting amount is put on top. We write \$5 as \$5.00. We line up the decimal points to align the place values. Then we subtract. Jim should get back **\$3.75.**

$$\begin{array}{r} {}^{4}\not{\$}\,{}^{9}\not{5}.\not{0}\,{}^{1}0 \\ -\ \$1.2\,5 \\ \hline \$3.7\,5 \end{array}$$

We can check the answer to a subtraction problem by adding. If we add the answer (difference) to the amount subtracted, the total should equal the starting amount. We do not need to

LESSON PRACTICE

Practice set Follow the four-step method to solve each problem. Along with each answer, include the equation you use to solve the problem.

a. The population of Castor is 26,290. The population of Weston is 18,962. How many more people live in Castor than live in Weston?

b. How many years were there from 1066 to 1215?

MIXED PRACTICE

Problem set

1. (12) When the sum of 8 and 5 is subtracted from the product of 8 and 5, what is the difference?

2. (12) The Moon is about two hundred fifty thousand miles from the Earth. Use digits to write that distance.

3. (12) Use words to write 521,000,000,000.

4. (12) Use digits to write five million, two hundred thousand.

5. (2) Robin Hood roamed Sherwood Forest with sevenscore merry men. A score is twenty, so sevenscore is seven twenties. Find how many merry men roamed with Robin.

6. (11) The beanstalk was 1000 meters tall. The giant had climbed down 487 meters before Jack could chop down the beanstalk. How far did the giant fall? (Write an equation and solve the problem.)

7. (13) At Big River Summer Camp there are 503 girls and 478 boys. How many more girls than boys attend Big River Summer Camp? (Write an equation and solve the problem.)

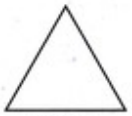
8. (1) $99 + 100 + 101$

9. (5) $9 \times 10 \times 11$

10. (12) Which digit is in the thousands place in 54,321?

11. (12) What is the place value of the 1 in 1,234,567,890?

12. (8) The three sides of an equilateral triangle are equal in length. What is the perimeter of the equilateral triangle shown?



LESSON

27 Measures of a Circle

WARM-UP

Facts Practice: 100 Multiplication Facts (Test E)

Mental Math: Count up and down by 3's between 3 and 60.
Count up and down by 6's between 6 and 60.

a. 7 × 52 **b.** 6 × 33 **c.** 63 + 19
d. 256 + 50 **e.** \$10.00 − \$7.25 **f.** $\frac{1}{2}$ of 86
g. 8 × 8, − 1, ÷ 7, × 2, + 2, ÷ 2

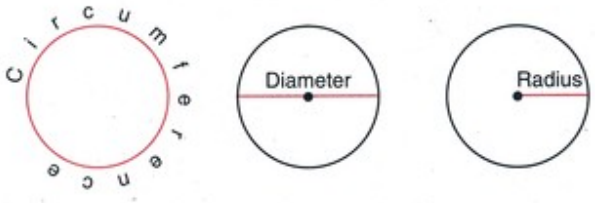
Problem Solving:

The digits 1 through 9 are used in this subtraction problem. Copy the problem and fill in the missing digits.

$$\begin{array}{r} \_\_\_ \\ -\ 452 \\ \hline 3\_\_ \end{array}$$

NEW CONCEPT

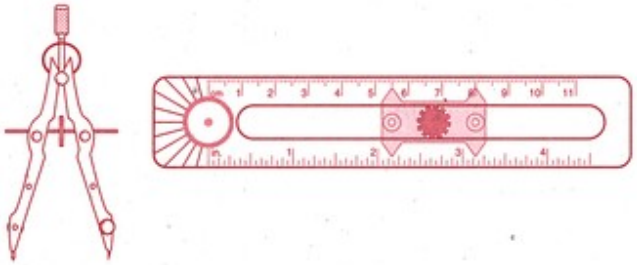
There are several ways to measure a circle. We can measure the distance around the circle, the distance across the circle, and the distance from the center of the circle to the circle itself. The pictures below identify these measures.



The **circumference** is the distance **around** the circle. This distance is the same as the perimeter of a circle. The **diameter** is the distance **across** a circle through its center. The **radius** is the distance from the center to the circle. The plural of *radius* is **radii.** For any circle, the diameter is twice the length of the radius.

Activity: *Using a Compass*

A **compass** is a tool for drawing a circle. Here we show two types:



To use a compass, we select a radius and a center point for a circle. Then we rotate the compass about the center point to draw the circle. In this activity you will use a compass and paper to draw circles with given radii.

Materials needed:

- compass and pencil
- plain paper

Draw a circle with each given radius:

a. 2 in.

b. 3 cm

c. $1\frac{3}{4}$ in.

Concentric circles are circles with the same center. A bull's-eye target is an example of concentric circles.

d. Draw three concentric circles with radii of 4 cm, 5 cm, and 6 cm.

Example 1 What is the name for the perimeter of a circle?

Solution The distance around a circle is its **circumference.**

Example 2 If the radius of a circle is 4 cm, what is its diameter?

Solution The diameter of a circle is twice its radius—in this case, **8 cm.**

4. (76) Compare. First convert each fraction to decimal form.

$$\frac{2}{5} \bigcirc \frac{1}{4}$$

5. (74, 75) (a) What fraction of this circle is shaded?

(b) Convert the answer from part (a) to a decimal number.

(c) What percent of this circle is shaded?

6. (74) Convert $2\frac{1}{2}$ to a decimal number.

7. (73) Write 3.45 as a reduced mixed number.

8. (73, 75) (a) Write 0.04 as a reduced fraction.

(b) Write 0.04 as a percent.

9. (43) Instead of dividing 200 by 18, Sam found half of each number and then divided. Show Sam's division problem and write the quotient as a mixed number.

10. (61) $6\frac{1}{3} + 3\frac{1}{4} + 2\frac{1}{2}$

11. (42) $\frac{4}{5} = \frac{?}{100}$

12. (72) $\left(2\frac{1}{2}\right)\left(3\frac{1}{3}\right)\left(1\frac{1}{5}\right)$

13. (68) $5 \div 2\frac{1}{2}$

Find each missing number:

14. (43) $6.7 + 0.48 + n = 8$

15. (43) $12 - d = 4.75$

16. (39) 0.35×0.45

17. (38, 52) $4.3 \div 10^2$

18. (Inv. 5) Find the median of these numbers:

0.3, 0.25, 0.313, 0.2, 0.27

19. (16) Estimate the sum of 3926 and 5184 to the nearest thousand.

20. (19) List all the prime numbers between 40 and 50.

21. (75) Twelve of the 25 animals were herbivores. What percent of the animals were herbivores?

Lesson 66 Multiply:

1. $3 \times 1\frac{1}{4}$ **2.** $1\frac{1}{2} \times 3$ **3.** $1\frac{1}{2} \times 1\frac{1}{4}$

4. $1\frac{2}{3} \times 2\frac{1}{2}$ **5.** $3\frac{1}{2} \times 5$ **6.** $1\frac{3}{4} \times 1\frac{1}{2}$

7. $3\frac{1}{3} \times 1\frac{2}{3}$ **8.** $7\frac{1}{2} \times 2$ **9.** $\frac{4}{5} \times 1\frac{1}{5}$

10. $\frac{5}{6} \times 1\frac{1}{5}$ **11.** $1\frac{1}{2} \times 1\frac{1}{3}$ **12.** $1\frac{1}{2} \times 1\frac{2}{3}$

13. $1\frac{1}{4} \times 2\frac{2}{5}$ **14.** $3\frac{2}{3} \times 3$ **15.** $4 \times 3\frac{1}{2}$

16. $\frac{5}{6} \times 3\frac{3}{5}$ **17.** $3\frac{1}{3} \times 2\frac{1}{10}$ **18.** $5\frac{1}{3} \times 1\frac{1}{8}$

19. $2\frac{1}{2} \times 1\frac{1}{3}$ **20.** $\frac{7}{8} \times 2\frac{2}{3}$ **21.** $1\frac{2}{5} \times 2\frac{1}{2}$

Lesson 68 Divide:

1. $1\frac{1}{2} \div 3$ **2.** $3 \div 1\frac{1}{2}$ **3.** $1\frac{2}{3} \div 2$

4. $2 \div 1\frac{2}{3}$ **5.** $\frac{3}{4} \div 1\frac{1}{2}$ **6.** $1\frac{1}{2} \div \frac{3}{4}$

7. $1\frac{2}{3} \div 1\frac{1}{2}$ **8.** $1\frac{1}{2} \div 1\frac{2}{3}$ **9.** $\frac{3}{8} \div 2$

10. $2 \div \frac{3}{8}$ **11.** $1\frac{3}{5} \div 2\frac{1}{3}$ **12.** $2\frac{1}{3} \div 1\frac{3}{5}$

13. $4\frac{1}{2} \div 2\frac{1}{4}$ **14.** $2\frac{1}{4} \div 4\frac{1}{2}$ **15.** $5 \div 1\frac{1}{4}$

16. $1\frac{1}{4} \div 5$ **17.** $2\frac{2}{3} \div 2$ **18.** $2 \div 2\frac{2}{3}$

19. $2\frac{1}{2} \div 1\frac{3}{4}$ **20.** $1\frac{3}{4} \div 2\frac{1}{2}$ **21.** $\frac{3}{4} \div 2\frac{1}{4}$