LESSON

49 Adding Mixed Measures

WARM-UP

Facts Practice: + − × ÷ Decimals (Test J)

Mental Math:

a. 8 × $6.50

b. 25.75 × 10

c. $\frac{4}{x} = \frac{40}{100}$

d. Estimate: 12.11 ÷ 1.9

e. $\sqrt{400}$

f. $\frac{3}{10}$ of 200

g. Find the sum, difference, product, and quotient of $\frac{3}{5}$ and $\frac{1}{3}$.

Problem Solving:

The teacher asked for two volunteers, and Adam, Blanca, and Chad raised their hands. From these three students, list the possible combinations of two students the teacher could select.

NEW CONCEPT

A mixed measure is a measurement that includes different units from the same category (length, volume, time, etc.).

Ivan is 5 feet 8 inches tall.

The movie was 1 hour 48 minutes long.

To add mixed measures, we align the numbers in order to add units that are the same. Then we simplify when possible.

Example 1 Add and simplify: 1 yd 2 ft 7 in. + 2 yd 2 ft 8 in.

Solution We add like units, and then we simplify from right to left.

$$\begin{array}{r} 1 \text{ yd } 2 \text{ ft } 7 \text{ in.} \\ +\ 2 \text{ yd } 2 \text{ ft } 8 \text{ in.} \\ \hline 3 \text{ yd } 4 \text{ ft } 15 \text{ in.} \end{array}$$

We change 15 in. to 1 ft 3 in. and add to 4 ft. Now we have

3 yd 5 ft 3 in.

Then we change 5 ft to 1 yd 2 ft and add to 3 yd. Now we have

4 yd 2 ft 3 in.

Example 2 Add and simplify:

$$\begin{array}{r} 2 \text{ hr } 40 \text{ min } 35 \text{ s} \\ +\ 1 \text{ hr } 45 \text{ min } 50 \text{ s} \\ \hline \end{array}$$

Solution We add. Then we simplify from right to left.

$$\begin{array}{r} 2 \text{ hr } 40 \text{ min } 35 \text{ s} \\ +\ 1 \text{ hr } 45 \text{ min } 50 \text{ s} \\ \hline 3 \text{ hr } 85 \text{ min } 85 \text{ s} \end{array}$$

We change 85 s to 1 min 25 s and add to 85 min. Now we have

3 hr 86 min 25 s

Then we simplify 86 min to 1 hr 26 min and combine hours.

4 hr 26 min 25 s

LESSON PRACTICE

Practice set* **a.** Change 70 inches to feet and inches.

b. Change 6 feet 3 inches to inches.

c. Simplify: 5 ft 20 in.

d. Add: 2 yd 1 ft 8 in. + 1 yd 2 ft 9 in.

e. Add: 5 hr 42 min 53 s + 6 hr 17 min 27 s

MIXED PRACTICE

Problem set

(35, 45) **1.** What is the quotient when the sum of 0.2 and 0.05 is divided by the product of 0.2 and 0.05?

(44) **2.** Darren carried the football 20 times and gained a total of 184 yards. What was the average number of yards he gained on each carry? Write the answer as a decimal number.

(46) **3.** Artemis bought two dozen arrows for six dollars. What was the cost of each arrow?

(18) **4.** Jeffrey counted the sides on three octagons, two hexagons, a pentagon, and two quadrilaterals. Altogether, how many sides did he count?

(28, 35) **5.** What is the mean of these numbers?

6.21, 4.38, 7.5, 6.3, 5.91, 8.04

6. (22, 36) Diagram this statement. Then answer the questions that follow.

Only two ninths of the 72 billy goats were gruff. The rest were cordial.

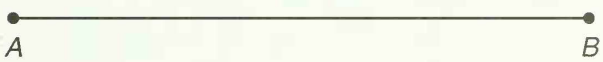
(a) How many of the billy goats were cordial?

(b) What was the ratio of gruff billy goats to cordial billy goats?

7. (42) Arrange these numbers in order from least to greatest:

$$0.\overline{5},\ 0.5,\ 0.\overline{54}$$

8. (8) (a) Estimate the length of segment AB in inches.



(b) Measure the length of segment AB to the nearest eighth of an inch.

9. (48) Write each of these numbers as a percent:

(a) 0.9 (b) $1\frac{3}{5}$ (c) $\frac{5}{6}$

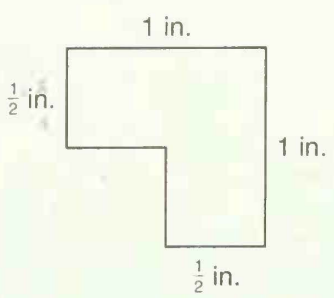
10. (48) Complete the table.

Fraction	Decimal	Percent
(a)	(b)	75%
(c)	(d)	5%

11. (13) Mathea's resting heart rate is 62 beats per minute. While she is resting, about how many times will her heart beat in an hour?

12. (36) What is the probability of rolling an even prime number with one roll of a die (dot cube)?

13. (37) A $\frac{1}{2}$-by-$\frac{1}{2}$-inch square was cut from a 1-by-1-inch square.



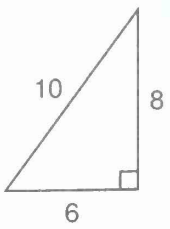
(a) What was the area of the original square?

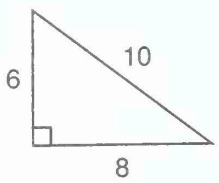
(b) What is the area of the square that was removed?

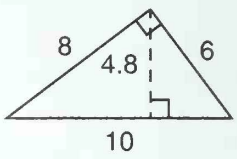
(c) What is the area of the remaining figure?

14. (19) What is the perimeter of the figure in problem 13?

15. (37) The figures below show a triangle with sides 6 cm, 8 cm, and 10 cm long in three orientations. What is the height of the triangle when the base is







(a) 6 cm? (b) 8 cm? (c) 10 cm?

Solve:

16. (39) $\frac{y}{100} = \frac{18}{45}$

17. (39) $\frac{35}{40} = \frac{1.4}{m}$

18. (30) $\frac{1}{2} - n = \frac{1}{6}$

19. (35) $9d = 2.61$

Simplify:

20. (20) $\sqrt{100} + 4^3$

21. (47) 3.14×10^4

22. (23, 30) $3\frac{3}{4} + \left(4\frac{1}{6} - 2\frac{1}{2}\right)$

23. (26) $6\frac{2}{3} \cdot \left(3\frac{3}{4} \div 1\frac{1}{2}\right)$

24. (49)
$$\begin{array}{r} 3 \text{ days } 8 \text{ hr } 15 \text{ min} \\ + \ 2 \text{ days } 15 \text{ hr } 45 \text{ min} \\ \hline \end{array}$$

25. (49)
$$\begin{array}{r} 1 \text{ yd } 2 \text{ ft } 6 \text{ in.} \\ + \ 2 \text{ yd } 1 \text{ ft } 9 \text{ in.} \\ \hline \end{array}$$

26. (45) $\$18.00 \div 0.06$

27. (29, 33) Describe how to estimate the quotient when 35.675 is divided by $2\frac{7}{8}$.

28. (46) The bat cost \$18.50. The ball cost \$3.50. What was the total price of the bat and ball including 6% sales tax?

29. (41) Evaluate: LWH if $L = 0.5$, $W = 0.2$, and $H = 0.1$

30. (40) This quadrilateral is a rectangle. Find the measures of $\angle a$, $\angle b$, and $\angle c$.