



## Canceling Before Multiplying Fractions

In the following problem, we multiply, then rewrite the answer in simplest form.

$$\frac{4}{7} \times \frac{1}{6} = \frac{4}{42} = \frac{2}{21}$$

We can save work when multiplying fractions if we cancel first. Canceling is a way to simplify fractions before we multiply. Find one numerator and one denominator that are divisible by the same number. You must always cancel diagonally, never horizontally. See how this is done.

$$\frac{4}{7} \times \frac{1}{6} = ?$$

$4 \div 2 = 2$

$$\frac{2}{7} \times \frac{1}{3} =$$

$6 \div 2 = 3$

$$\frac{2}{7} \times \frac{1}{3} = \frac{2}{21}$$

In this problem, 4 and 6 are both divisible by two. Cancel out 4 and 6.

Divide 4 by 2 and divide 6 by 2. Write the quotients in place of the canceled numbers.

Now multiply as usual, using the new numerators and denominators. The answer is already in simplest form. It can't be simplified any further.

Sometimes a diagonal numerator and denominator are the same number. This is the easiest kind of cancellation, because they both cancel to 1.

$$\frac{3}{5} \times \frac{5}{8} = \frac{3}{8}$$

$5 \div 5 = 1$

$5 \div 5 = 1$

5 and 5 are both divisible by themselves.

Cancel both 5's to 1 and multiply as usual.

Again, there is no need to simplify the answer.

It has already been changed to simplest form.

Sometimes we can cancel **both** diagonal numerators and denominators.

$$\frac{3}{10} \times \frac{2}{3} = \frac{1}{5}$$

10 and 2 are both divisible by 2.

3 and 3 both cancel to 1. The

answer is in simplest form.



Expand this number using multiples of ten.

9.  $72,010,612 =$  \_\_\_\_\_  
 \_\_\_\_\_

Write  $<$  or  $>$ .

10. a.  $6 \square -3$

b.  $-4 \square 4$

c.  $-24 \square 7$

d.  $-13 \square -6$

— ?... *Mental Math* —

11. a.  $2.3 \div 1,000 =$  \_\_\_\_\_ b.  $7.01 \div 100 =$  \_\_\_\_\_ c.  $0.08 \times 100 =$  \_\_\_\_\_

12. a.  $49.6 \times 100 =$  \_\_\_\_\_ b.  $4.3 \times 1,000 =$  \_\_\_\_\_ c.  $1.9 \div 10 =$  \_\_\_\_\_

Write each as a three-place decimal.

13. a.  $1.9$  \_\_\_\_\_


b.  $0.6$  \_\_\_\_\_

c.  $7.33400$  \_\_\_\_\_


Write the number and decimal.

14. a. Negative twenty-seven \_\_\_\_\_

b. Six and three-thousandths \_\_\_\_\_

- ☆  **15.** The mission school could not hold all the students who wanted to attend, so some of the students came in the morning and some in the afternoon. The morning class contained 35 boys and 25 girls. If a total of 120 students attended each day, how many students attended the afternoon class?

Answer: \_\_\_\_\_

-  **16.** José had six subjects that he studied in school each day. By 10:00 he had completed  $\frac{1}{3}$  of his subjects. How many subjects did he still need to complete that day?

Answer: \_\_\_\_\_

Lesson 6

**+** **×** Skill Builders

Write the remainder as a fraction.

17. a.  $2 \overline{) \$3.74}$       b.  $\begin{array}{r} 673.56 \\ - 58 \\ \hline \end{array}$       c.  $\begin{array}{r} 93 \\ 0.692 \\ + 1.008 \\ \hline \end{array}$       d.  $4 \overline{) 3,379}$

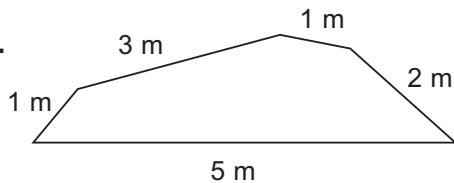
18. a.  $\begin{array}{r} 235.36 \\ - 56.94 \\ \hline \end{array}$       b.  $\begin{array}{r} 46 \\ 1.8 \\ 63.942 \\ 0.009 \\ + 48.2 \\ \hline \end{array}$       c.  $\begin{array}{r} 167 \\ - 49.76 \\ \hline \end{array}$       d.  $\begin{array}{r} 46.6 \\ + 23.7 \\ \hline \end{array}$

Simplify these expressions.

19. a.  $16 \div (9 - 5) + 6 \div 3$       b.  $31 - 6 \times 5 + 3$       c.  $18 \div 3 \div 3 \times 2$

Find the perimeter.

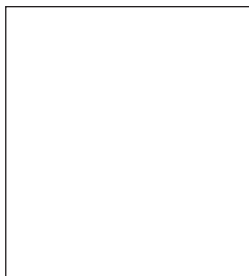
20. \_\_\_\_\_



Because of the great height of the Andes Mountains, it is possible to stand in the steamy hot Amazon jungle, and look up at a snow-capped peak far above.

Copy and solve.

21.  $69.23 + 87.54 + 2.69$



Multiply. Cancel where you can.

22. a.  $\frac{5}{7} \times \frac{7}{12} =$  \_\_\_\_\_      b.  $\frac{8}{11} \times \frac{7}{8} =$  \_\_\_\_\_      c.  $\frac{2}{3} \times \frac{3}{8} =$  \_\_\_\_\_



## Revising Two-Digit Divisor Estimates

○ So far, when you have estimated your quotients in long division, your estimates have worked. But sometimes you will discover that even if your estimate is a good one, the product will be too large when you multiply the exact numbers. You will not be able to subtract. Then you will need to erase your estimated quotient and try the next smaller number.

$$\begin{array}{r} 8 \\ 64 \overline{)503} \\ \underline{512} \end{array}$$

Divide: 64 rounds to 60 and 60 goes 8 times into 503. Try 8.

Multiply:  $8 \times 64 = 512$

Subtract:  $503 - 512$  doesn't work.

$$\begin{array}{r} 7R55 \\ 64 \overline{)503} \\ \underline{448} \\ 55 \end{array}$$

Try again with 7.

Multiply:  $7 \times 64 = 448$

Subtract:  $503 - 448 = 55$

Compare: 55 is less than 64, so the remainder is 55.

Other times the estimate will be too small. You will discover this when you compare. If the remainder is larger than the divisor, you must try a larger estimate.

$$\begin{array}{r} 8 \\ 55 \overline{)503} \\ \underline{440} \\ 63 \end{array}$$

Divide: 55 rounds to 60 and 60 goes 8 times into 503. Try 8.

Multiply:  $8 \times 55 = 440$

Subtract:  $503 - 440 = 63$

Compare: Is 63 less than the divisor 55?

No! 55 goes into 503 one more time.

$$\begin{array}{r} 9R8 \\ 55 \overline{)503} \\ \underline{495} \\ 8 \end{array}$$

Try again with 9.

Multiply:  $9 \times 55 = 495$

Subtract:  $503 - 495 = 8$

Compare: Is 8 less than 55?

Yes, the correct remainder is 8.

△ **Solve.** Have your teacher watch you do the first row.

1. a.  $24 \overline{)156}$

b.  $37 \overline{)315}$

c.  $25 \overline{)156}$



—  $+$   $-$   $\times$  *Skill Builders* —

13. a.  $7 \overline{)4,923}$

b.  $76 \overline{)6,255}$

c. 
$$\begin{array}{r} 246 \\ \times 738 \\ \hline \end{array}$$

14. a. 
$$\begin{array}{r} 3\frac{3}{4} \\ - 1\frac{1}{2} \\ \hline \end{array}$$

b. 
$$\begin{array}{r} \frac{3}{4} \\ + \frac{3}{8} \\ \hline \end{array}$$

c.  $58 \overline{)189}$



15. The Andean condor is a large vulture weighing up to 11.8 kilograms. The smallest bird is the bee hummingbird from Cuba, weighing only 0.003 kilograms. Find the difference between the weight of an Andean condor and a bee hummingbird.

Answer: \_\_\_\_\_



Expand this number using multiples of ten.

16.  $19,649,702 =$  \_\_\_\_\_

\_\_\_\_\_

Lesson 7

— ?... Mental Math —

17.  $10^2$   $-85$   $+27$   $\div 4$   $\div 3$   $\times 12 =$  \_\_\_\_\_

Round to the nearest whole number.

18. a. 99.36 \_\_\_\_\_      b. 4.851 \_\_\_\_\_      c. 25.5 \_\_\_\_\_      d. 39.9 \_\_\_\_\_

Write mixed numbers as decimal tenths. Write decimals as fractions using  $\frac{1}{2}$ .

19. a.  $4\frac{1}{2}$  \_\_\_\_\_      b. 6.50 \_\_\_\_\_      c.  $8\frac{1}{2}$  \_\_\_\_\_

Order from greatest to least.

20. 10.48    10.84    12.4    10.4    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

21. 8.723    8.732    8.727    8.372    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

Add or subtract. Remove zeros to shorten the decimal.

22. a.  $1.65 + 9.72 + 0.23 =$  \_\_\_\_\_      b.  $20.08 - 10.28 =$  \_\_\_\_\_

Solve.

23. a.  $13^2 =$  \_\_\_\_\_      b.  $10^2 =$  \_\_\_\_\_      c.  $14^2 =$  \_\_\_\_\_      d.  $7^2 =$  \_\_\_\_\_

24. a.  $\sqrt{64} =$  \_\_\_\_\_      b.  $\sqrt{4} =$  \_\_\_\_\_      c.  $\sqrt{1} =$  \_\_\_\_\_      d.  $\sqrt{225} =$  \_\_\_\_\_

Solve.

25. a.  $34 \overline{)193}$       b.  $36 \overline{)185}$       c.  $52 \overline{)150}$