Multiplying and Dividing Whole Numbers: Applications

The multiplication table must be known. See the table on the last page of this worksheet.

It is easier to do multiplication of large numbers vertically and to use long division,)_____ , to divide large numbers.

REMEMBER: 1. Order of factors does not matter.
2. Order does matter in division.

USE: divisor)_____ dividend for the equivalent $\frac{\text{dividend}}{\text{divisor}}$ You should check division as follows:

divisor × quotient + remainder = dividend

I. **PROBLEMS** to multiply and divide: Do these problems without a calculator. Then check them by doing them again with a calculator.

1-3. Multiply:

1. 365 × 24

2. 3,059 × 602

3. 583 × 170

4.-6. Divide: How can you use multiplication to check? When you divide with a calculator, use the correct order.

Dividend ÷ divisor =

4. 16,281 ÷ 27

5. $\frac{15960}{42}$

6. 35)2986

To find the remainder when you divide with a calculator, think how you check division. With your calculator multiply divisor × the whole number part of the quotient (before the decimal point). Then subtract that product from the dividend. The difference is the remainder.

II. **APPLICATIONS:**

BEFORE YOU START:

1. You must understand the operations. REVIEW the definitions of multiplication and division in your text.

2. The problem must be read carefully so that you will know what numbers are known; what number is to befound and what operation(s) must be used to find that number.

There are key words that will imply multiplication or division, but using common sense is the most helpful! Put yourself in the "real world" situation described in the problem. Be sure to see if your answer seems reasonable.

KEY WORDS:

MULTIPLICATION	**DIVISION**
"product" - answer for multiplication "times" "divided by"	"quotient" - answer for division "divided into"

REMEMBER that multiplication is used in cases where there is repeated addition.

$6 a week for 5 weeks is $6 + $6 + $6 + $6 + $6 or 5 × 6 4 lb. a box; 3

boxes 4 lb. + 4 lb. + 4 lb. or 3 × 4 lb.

Amount of 1 payment × number of payments = total paid

Value of 1 item × number of items = total value

II. **PROBLEMS:**

1. Find the product of 12 and 3.

2. Find the quotient of 12 and 3. (We agree here that the dividend is first)

3. Twelve cans are packed in a box. There are 6 boxes. How many cans are there?

4. Twelve cans are in each box. There are ninety-six cans. How many boxes are there?

5. How many cans are in each box if it takes seven boxes to pack 105 cans?

6. John paid a total of $336 in twelve months. Find the monthly payment.

7. Greer will pay $56 a week for her share of an apartment. What will she pay in 13 weeks?

8. Tom must repay a total of $864. He pays $36 a month. For how many months must he make payments?

9. If Tom owes a total of $700 and he makes a down payment of $140, find his monthly payment if he paysoff the balance in eight months. (Think about this situation: You know the total Tom must pay. Subtract the $140 that he will pay only one time.) What is his balance? How much must he pay each month for 8 months to pay this balance?

10. Laura made a $300 down payment on her furniture and then paid eighteen monthly payments of $86 each.Find the total cost of her furniture. (THINK: You do not know the total Laura paid. She will pay $300 one time. She will pay $86 eighteen times. What is the total of the eighteen payments? What is the total she paid?)

11. A manufacturer can produce 180 jackets each hour. He ships the jackets in boxes of 12 jackets each. How many boxes of jackets will he be able to ship after eight hours?

THINK: How many jackets will he make in eight hours?
Number of jackets in 1 hr. × no. of hours. = Total Number of Jackets

How many boxes are needed for all of these jackets?
Number of jackets in 1 box × no. of boxes = Total Number of Jackets

This is not the only way to work this problem. Can you think of another way?

ANSWERS

PART I.

1. 8,760 2. 1,841,518 3. 99,110 4. 603 5. 380

6. 85 r. 11 With calculator 85.314285. When you divide with a calculator, you can find the remainder that you would have gotten by using long division. Study the comment by problem 6 in PART
I. Then study the following examples. With your calculator 85 × 35 = 2975, and 2986
- 2975 = 11. The remainder is 11

PART II.

1. 36, (12 × 3) 2. 4, $(3\overline{)12}$

3. No. of cans in 1 box × no. of boxes = total no. of cans12 × 6 = ?
Both factors are known, so multiply. 12 × 6 = 72

4. Number of cans in 1 box × nunber of boxes = total number of cans12 × ? = 96
Both factors are not known, so divide the known factor into the product.

$12\overline{)96}^{\,8}$ CHECK: 8 boxes × 12 cans in each is 96 cans

OR: $12 \cdot n = 96$

$\frac{}{12} \quad \frac{}{12} \quad \frac{12 \cdot n}{} = 96$

n 8= boxes

5. Number of cans in 1 box × number of boxes = total number of cans
n 7 105× =
Both factors are not known, so divide the known factor into the product.
n 7× 105

$\frac{\quad}{7} = \frac{\quad}{7}$ n = 15 cans in a box

Answers (continued):

6. Amount of 1 payment × Number of payments = total amount paid ? × 12 = $336

Only one factor is known, so divide by that factor.

$12\overline{)336}$ 28 each monthly payment OR $n \times 12 = 336$

$$\frac{n\ 12\times}{12} = \frac{336}{12}$$

$n = \$28$

7. Amt. of 1 payment × No. of payments = total amount paid 56 × 13 = ?

Both factors are known so multiply.

56 × 13 = $728 total paid

8. Amount of 1 payment × Number of payments = total amount paid

36 × ? = 864

Divide (you only know one factor)

$36\overline{)864}$ 24 OR $\frac{36 \cdot n}{36} = \frac{\quad}{\quad}$ 864 Tom will make payments for 24 months $n = 24$

9. $700 total owed

−140 down payment

$560 balance to pay in monthly payments

Amount of 1 payment × Number of payments = total amount paid ?

× 8 = 560

Divide: only one factor is known.

$8\overline{)560}$ 70 OR $\frac{n\ 8}{8} = \frac{560}{\quad}$ The amount of 1 payment is $70 $n = 70$

10. Laura's total is 1 down payment + $86 each month for18 months Amount of 1 payment × Number of payments = total of these payments 86 × 18 = ?

Multiply since both factors are known.

$86 × 18 = $1,548 total of monthly payments

Down payment + Total of monthly payments

300 + 1548 = $1848 total paid for the furniture

11. 180 jackets in 1 hr. × 8 hrs. = 1440 jackets
Then: (12 jackets in 1 box) × (? boxes) = 1440 jackets

$12\overline{)1440}$ 120

120 boxes are required

Multiplication Table

×	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0 2 4 6 8 10 12 14 16 18 20 22 24			**3**	0 3 6 9 12 15 18 21 24 27 30 33 36						**4**	0 4 8 12 16 20 24 28 32 36 40 44 48	
5	0 5 10 15 20 25 30 35 40 45 50 55 60												
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144