

Multiplicative Comparison and Factors: practice solutions, Grade 4 – download the PDF

Written solutions to the chapter problems. Check each step, then correct yourself.

1 Reading a multiplication fact



Since $4 \times 7 = 28$, the product can be compared with either factor.

“28 is 4 times as many as 7” and “28 is 7 times as many as 4.”

2 Puppy and dog



Let d be the weight of the dog in pounds. Then $d = 4 \times 8$.

$4 \times 8 = 32$. The dog weighs 32 pounds.

3 Tall tree



Multiply the height of the bush by 7: $7 \times 5 = 35$.

The oak tree is 35 feet tall.

4 Factor pairs of 18



Test 1, 2, 3: $1 \times 18 = 18$, $2 \times 9 = 18$, $3 \times 6 = 18$. Four does not work ($4 \times 4 = 16$, $4 \times 5 = 20$), and the next test, 5, fails too, so we stop.

Factor pairs: 1 and 18, 2 and 9, 3 and 6. Factors: 1, 2, 3, 6, 9, 18.

5 Skip counting by 8



Skip count by 8: 8, 16, 24, 32, 40, 48. Check the last one: $6 \times 8 = 48$.

6 True or false?



- a. True: $6 \times 7 = 42$.
- b. False: the multiples of 4 are 4, 8, ..., 24, 28, ... and 25 is skipped.
- c. True: $6 \times 9 = 54$.
- d. False: 1 has only one factor. A prime number needs exactly two.

7 Ones digit test



Look at the ones digit.

- 340: ones digit 0, so divisible by 2, 5 and 10.
- 215: ones digit 5, so divisible by 5 only.
- 462: ones digit 2, so divisible by 2 only.
- 1,000: ones digit 0, so divisible by 2, 5 and 10.

8

More or times as many?

Omar: $3 \times 6 = 18$ pages. Pia: $6 + 3 = 9$ pages.

$18 - 9 = 9$. Omar read 18 pages and Pia read 9 pages, so Omar read 9 more pages than Pia.

9

Trail length

Let n be the number of times. $56 = n \times 8$, so $n = 56 \div 8 = 7$.

The bike path is 7 times as long as the walking trail.

10

Factors of 48

1×48 , 2×24 , 3×16 , 4×12 , 6×8 . Five and seven are not factors. After 6 and 8 the pairs would repeat, so we stop.

The factors are 1, 2, 3, 4, 6, 8, 12, 16, 24 and 48. So 48 has 10 factors.

11

Sorting numbers

- 23: prime (not divisible by 2, 3 or 5, and $4 \times 6 = 24$).
- 39: composite, $3 \times 13 = 39$.
- 51: composite, $3 \times 17 = 51$.
- 59: prime (not divisible by 2, 3, 5, or 7, as $7 \times 8 = 56$ and $7 \times 9 = 63$).
- 77: composite, $7 \times 11 = 77$.
- 91: composite, $7 \times 13 = 91$.

12 Digit sums



- 5,274: $5 + 2 + 7 + 4 = 18$, so divisible by 3 and by 9.
- 3,185: $3 + 1 + 8 + 5 = 17$, so by neither.
- 7,326: $7 + 3 + 2 + 6 = 18$, so by 3 and by 9.
- 4,512: $4 + 5 + 1 + 2 = 12$, so by 3 only, since 12 is not a multiple of 9.

13 Add 5 pattern



7, 12, 17, 22, 27, 32, 37, 42.

The ones digits alternate between 7 and 2. The terms alternate between odd and even.

14 Tile figures



Each figure has 4 tiles in each column, and Figure n has n columns, so it has $4 \times n$ tiles.

- a. $4 \times 7 = 28$ tiles.
- b. $40 \div 4 = 10$: Figure 10.
- c. No. The number of tiles is a multiple of 4, and 50 is not: $4 \times 12 = 48$ and $4 \times 13 = 52$.

15 Markers for two schools



First school: $9 \times 6 = 54$ markers.

Let m be the markers of the second school: $m = 3 \times 54 = 162$.

The second school bought 162 markers.

16 Mystery prime



The primes between 50 and 60 are 53 and 59, because 51, 55 and 57 are divisible by 3 or 5, and the even numbers are composite.

Digit sums: $5 + 3 = 8$ and $5 + 9 = 14$. I am 59.

17 Mystery multiple



The multiples of 24 are the multiples of both 6 and 8 in this range: 48, 72, 96. (Check:

$6 \times 8 = 48$, $6 \times 12 = 72$, $6 \times 16 = 96$, and 8 divides each of them.)

Digit sums: $4 + 8 = 12$, $7 + 2 = 9$, $9 + 6 = 15$. I am 72.

18 Most factors



List the factors: 21: 1, 3, 7, 21 (4). 22: 1, 2, 11, 22 (4). 23: 1, 23 (2). 24: 1, 2, 3, 4, 6, 8, 12, 24 (8). 25: 1, 5, 25 (3). 26: 1, 2, 13, 26 (4). 27: 1, 3, 9, 27 (4). 28: 1, 2, 4, 7, 14, 28 (6). 29: 1, 29 (2).

The number 24 has the most factors: 8 factors.

19 Always, sometimes, never



- a. False. The number 2 is prime and even.
- b. True. For example, 18 is divisible by 9 and by 3. It works because 9 is itself a multiple of 3 ($9 = 3 \times 3$).
- c. False. The number 5 is a multiple of 5 ($5 = 1 \times 5$) and is prime. Every other multiple of 5 is composite.

20 Subtract 7 pattern



- a. 100, 93, 86, 79, 72, 65, 58, 51, 44.
- b. The first term less than 50 is 44, the ninth term, since 51 is still greater than 50.
- c. Yes for 30: $100 - 70 = 30$ and $70 = 10 \times 7$, so it is the 11th term. No for 35: $100 - 35 = 65$, and 65 is not a multiple of 7 ($7 \times 9 = 63$, $7 \times 10 = 70$).

21 Chairs in rows



The factor pairs of 36 are 1 and 36, 2 and 18, 3 and 12, 4 and 9, 6 and 6. We cannot use 1 and 36.

She can make 4 rectangles: 2 rows of 18, 3 rows of 12, 4 rows of 9, or 6 rows of 6.

22 Movie and cartoon



- a. $90 = n \times 15$, so $n = 90 \div 15 = 6$. The movie is 6 times as long.
- b. $90 - 15 = 75$. The movie is 75 minutes longer.
- c. Part (a) compares by multiplication (how many copies of 15 fit in 90), and part (b) compares by subtraction (the difference between the lengths). They answer two different questions.



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