

Grade 3 · Properties of Multiplication · Worksheet Answer Key

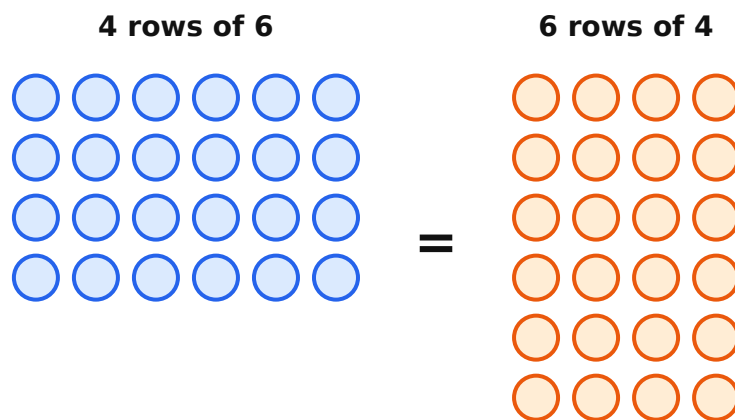
Common Core 3.OA.B.5 · mathovore.fr

Every problem below has a full worked solution with the final answer in bold. Compare each step with your own work, not just the answer. If a picture helps, redraw the array or the split rectangle and check the products again.

Grade 3 Common Core: 3.OA.B.5

Problem 1: Turn-around facts

The array has 4 rows with 6 dots in each row, so $4 \times 6 = 24$. Turn the array. It has 6 rows with 4 dots in each row, so $6 \times 4 = 24$.



Turning the array: 4 rows of 6 and 6 rows of 4 both make 24.

Answer: $4 \times 6 = 24$ and $6 \times 4 = 24$.

Problem 2: Swap the factors

The commutative property lets you swap the factors, so $7 \times 3 = 3 \times 7$. Both sides equal 21.

Answer: **7**.

Problem 3: Missing factor

Swap the factors on the right side: $5 \times 9 = 9 \times 5$. The missing number is 9. Check: $9 \times 5 = 45$ and $5 \times 9 = 45$.

Answer: **9**.

Problem 4: Use a known fact

Swapping the factors does not change the product. So 4×6 has the same product as 6×4 .

Answer: $4 \times 6 = 24$.

Problem 5: Same product?

Find each product and compare.

- a. $6 \times 4 = 24$ and $4 \times 6 = 24$: **same product**
- b. $7 \times 5 = 35$ and $5 \times 7 = 35$: **same product**
- c. $8 \times 3 = 24$ and $8 \times 4 = 32$: **different products**
- d. $9 \times 2 = 18$ and $3 \times 6 = 18$: **same product**

Problem 6: Group three factors

First way: $(2 \times 3) \times 4 = 6 \times 4 = 24$.

Second way: $2 \times (3 \times 4) = 2 \times 12 = 24$.

The products match. Answer: **24** both ways.

Problem 7: Missing number in a group

The associative property keeps the same numbers in the same order and moves the parentheses. The numbers 3, 2, and 5 appear in that order, so the missing number is 2. Check: $(3 \times 2) \times 5 = 6 \times 5 = 30$ and $3 \times (2 \times 5) = 3 \times 10 = 30$.

Answer: **2**.

Problem 8: Choose a friendly group

Multiply 5 and 2 first: $5 \times 2 = 10$. Then $10 \times 7 = 70$.

So $(5 \times 2) \times 7 = 10 \times 7 = 70$.

Answer: **70**.

Problem 9: Three factors

Group the first two: $3 \times 2 = 6$. Then $6 \times 4 = 24$. Another way: $2 \times 4 = 8$ and $3 \times 8 = 24$.

Answer: **24**.

Problem 10: Two ways to group

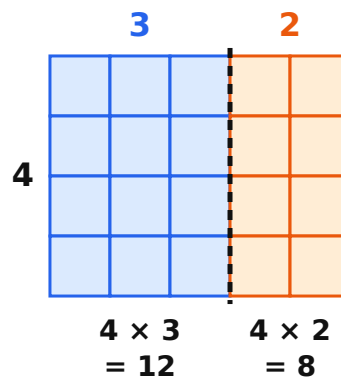
$$(2 \times 3) \times 5 = 6 \times 5 = 30.$$

$$2 \times (3 \times 5) = 2 \times 15 = 30.$$

Both products are **30**, so the grouping does not change the answer.

Problem 11: Split into two parts

Left part: $4 \times 3 = 12$. Right part: $4 \times 2 = 8$. Add: $12 + 8 = 20$.



Left part: 12 squares. Right part: 8 squares.

The whole rectangle has 4 rows and 5 columns, and $4 \times 5 = 20$. Answer: **20 squares**.

Problem 12: Break apart 7

Since $7 = 5 + 2$, the missing number is 2. Now $6 \times 5 = 30$ and $6 \times 2 = 12$. Add: $30 + 12 = 42$.

Answer: **2** and $6 \times 7 = 42$.

Problem 13: Break apart 6

$8 \times 6 = 8 \times (5 + 1)$. Multiply: $8 \times 5 = 40$ and $8 \times 1 = 8$. Add: $40 + 8 = 48$.

Answer: $8 \times 6 = 48$.

Problem 14: Split into equal parts

$7 \times 8 = 7 \times (4 + 4)$. Multiply: $7 \times 4 = 28$ and $7 \times 4 = 28$. Add: $28 + 28 = 56$.

Answer: $7 \times 8 = 56$.

Problem 15: Break apart 9

$7 \times 9 = 7 \times (5 + 4)$. Multiply: $7 \times 5 = 35$ and $7 \times 4 = 28$. Add: $35 + 28 = 63$.

Answer: $7 \times 9 = 63$.

Problem 16: Check both sides

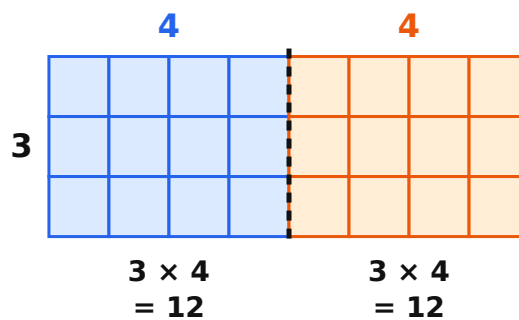
First: $4 + 3 = 7$, so $5 \times 7 = 35$.

Second: $5 \times 4 = 20$ and $5 \times 3 = 15$, and $20 + 15 = 35$.

Both values are **35**. The two expressions are equal, as the distributive property says.

Problem 17: Area model halves

Each half has 3 rows and 4 columns: $3 \times 4 = 12$. Two halves: $12 + 12 = 24$.



Each half has 12 squares.

The whole rectangle has 3 rows and 8 columns: $3 \times 8 = 24$.

Answer: $3 \times 4 = 12$ for each half and $3 \times 8 = 24$ for the whole.

Problem 18: Which split is correct?

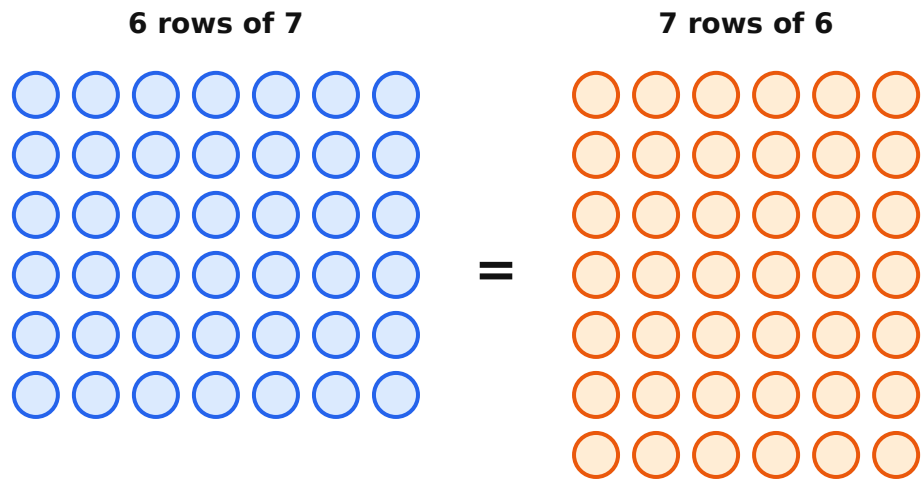
Split 8 into 5 and 3. Choice a: $6 \times 5 = 30$ and $6 \times 3 = 18$, and $30 + 18 = 48$, which equals $6 \times 8 = 48$.

Choice b: $30 + 3 = 33$, not 48. Choice c: $6 + 5 + 3 = 14$, not 48.

Answer: **choice a**.

Problem 19: Rows of chairs

Maya: $6 \times 7 = 42$. Jamal: $7 \times 6 = 42$.



Maya's 6 rows of 7 and Jamal's 7 rows of 6.

The factors are swapped, so the commutative property says the products match. Answer: **Yes, both set up 42 chairs.**

Problem 20: Pumpkin stands

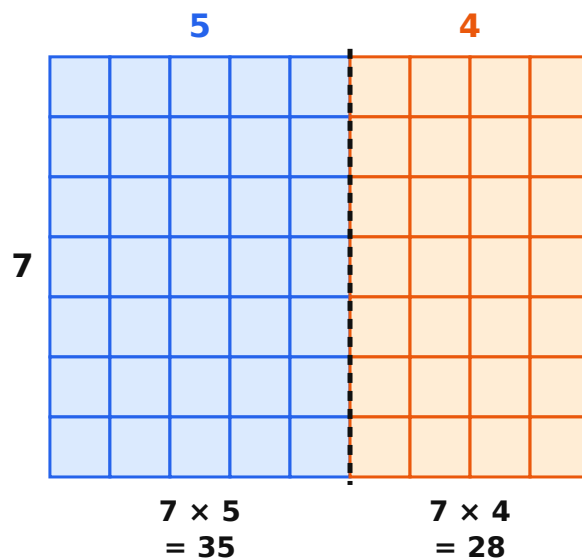
Grouping 1: $(3 \times 2) \times 5 = 6 \times 5 = 30$.

Grouping 2: $3 \times (2 \times 5) = 3 \times 10 = 30$.

Answer: **30 pumpkins.**

Problem 21: Bake sale trays

$7 \times 9 = 7 \times (5 + 4)$. Then $7 \times 5 = 35$ and $7 \times 4 = 28$.



35 cookies plus 28 cookies makes 63.

$35+28=63$. Answer: **63 cookies**.

Problem 22: Erasers in boxes

Group the first two factors: $(4 \times 3) \times 2 = 12 \times 2 = 24$.

Check another way: $4 \times (3 \times 2) = 4 \times 6 = 24$.

Answer: **24 erasers**.

Problem 23: School store pencils

Split 7 into 5 and 2. $8 \times 5 = 40$ and $8 \times 2 = 16$. Add: $40 + 16 = 56$.

Answer: **56 pencils**.

Problem 24: Garden plants

Priya: $9 \times 6 = 9 \times (5 + 1)$. Then $9 \times 5 = 45$ and $9 \times 1 = 9$, and $45 + 9 = 54$.

Diego: $6 \times 9 = 54$. By the commutative property, he is right.

Answer: **54 plants; yes**, Diego is right.