

Signed Product Power

Multiply rational numbers and explain what the products mean.

GRADE 7 • NY-7.NS.2.a

NY-7.NS.2.a "Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property..."

NAME _____

DATE _____

HOW SIGNS WORK

The sign rules keep the properties of multiplication true for rational numbers. Factors with the same sign have a positive product, and factors with different signs have a negative product. Multiply the absolute values, then use the signs to choose the sign of the answer.

WORKED EXAMPLE

Find $(-3/5)(-7/8)$.

1. The factors have the same sign, so the product is positive.
2. Multiply the numerators: $3 \times 7 = 21$.
3. Multiply the denominators: $5 \times 8 = 40$.

Answer: 21/40

PRACTICE 6 problems

1 Find $(-4)(9/11)$.

ANSWER _____

2 Find $(-11/12)(6)$.

ANSWER _____

3 Find $(-2/9)(-9/10)$.

ANSWER _____

4 Find $(4/11)(-22/9)$.

ANSWER _____

5 Find $(-1)(-13/9)$.

ANSWER _____

6 Use the distributive property to evaluate $(-2/11)(4 + -10)$.

ANSWER _____

APPLY IT Show your work

- 1** During a game design session, Maya's phone battery drops $\frac{1}{4}$ percent each minute for 16 minutes. Model the drop as a negative change. What is the total battery change?

WORK SPACE

ANSWER _____

- 2** Each time a student deletes a duplicate video clip, the project file size changes by $-\frac{2}{9}$ GB. After deleting 18 duplicate clips, what is the total change in file size?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Before calculating, decide whether $(-\frac{14}{15})(-\frac{10}{21})$ is positive or negative. Then find the product and explain how the signs and cancellation support your answer.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find $(-4)(9/11)$.	-36/11
2	Find $(-11/12)(6)$.	-11/2
3	Find $(-2/9)(-9/10)$.	1/5
4	Find $(4/11)(-22/9)$.	-8/9
5	Find $(-1)(-13/9)$.	13/9
6	Use the distributive property to evaluate $(-2/11)(4 + -10)$.	12/11

PART 2 • APPLY IT

1. **-4%; the battery decreases by 4 percentage points.** Write $(-1/4)(16) = -4$. The negative product represents a decrease in battery percentage.
2. **-4 GB; the file size decreases by 4 GB.** Write $(-2/9)(18) = -4$. The negative product means the file size is smaller.

CHALLENGE

Positive; 4/9. Two negative factors make a positive product, and 14/21 simplifies to 2/3 while 10/15 simplifies to 2/3, so the product is 4/9.

Accept equivalent fractions, such as $-36/11$ or $-3 \frac{3}{11}$. For word problems, accept a correct negative value with a clear statement that it represents a decrease.