MATHEMATICS · GRADES 7-9

Integer sign rules

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you get the sign right when multiplying or dividing positive and negative numbers, like working out whether a bank balance goes up or down after repeated charges. A negative times a negative is a positive, and getting that wrong flips the whole answer, from a gain to a loss or a profit to a debt. You need it whenever money, temperature, or height above and below zero is multiplied or divided, like repeated charges on an account or a temperature change over several days.



Rule

Count the negative factors.

An odd count of negatives gives a negative answer, and an even count gives a positive answer. Multiply the sizes as usual, then set the sign by the count.

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Worked examples

EXAMPLE 1

Q Decide the sign of $(-3) \times (-4) \times (-2)$

(-3)	(-4)	(-2)
negative	negative	negative

SOLUTION

Count the negative factors: there are 3, an odd number.

With an odd number of negatives, the answer comes out negative.

So the product is negative (in fact -24).

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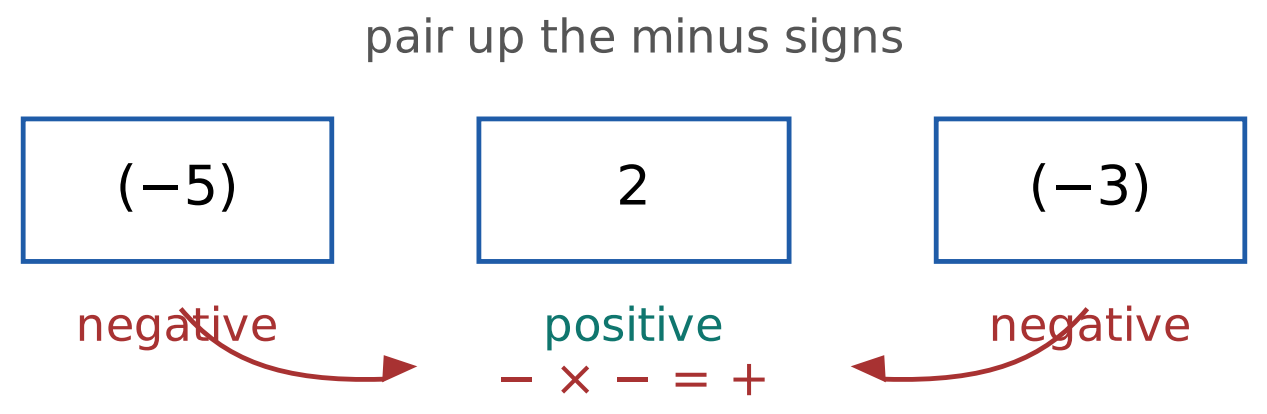
EXAMPLE 2

Q Decide the sign of $(-5) \times 2 \times (-3)$



SOLUTION

Count the negative factors: there are 2, an even number.

With an even number of negatives, the answer comes out positive.

So the product is positive (in fact 30).

Practice questions

1 You have 3 debts of 2 dollars each, and they are all cancelled. Is the change to your balance positive or negative?

A positive

B negative

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2 The temperature falls 2 degrees each hour for 3 hours. Is the total change positive or negative?

A positive

B negative

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3 Three numbers are multiplied: -5, -2 and -6. Is the answer positive or negative?

A positive

B negative

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4 Is $(-2)^3$ positive or negative?

A positive

B negative

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5 Which of these products is positive?

- **A** (-3) × (-2)
- **B** (-3) × 2
- **C** 3 × (-2)
- **D** (-3) × (-2) × (-1)

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6 How many negative factors must a product have for the answer to be negative?

- **A** An odd number
- **B** An even number
- **C** Any number
- **D** None

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7 **A debt of 3 dollars is cancelled 6 times. What is the total change?**

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8 **Decide the sign first, then work out 20 ÷ (-4). What is the answer?**

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9 **The temperature falls 7 degrees each hour, but 0 hours pass. What is the total change?**

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10 A shop loses 9 dollars a day. How many days does it take to lose 36 dollars?

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ANSWER KEY

1. positive

2. negative

3. negative

4. negative

5. (-3) × (-2)

6. An odd number

7. 18

8. -5

9. 0

10. 4

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