MATHEMATICS · GRADES 7-9

Dividing integers

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you split a gain or a loss fairly. Sharing a debt between friends means dividing a negative amount, and dividing up a refund means splitting a positive one. The sign of the answer tells you whether everyone gains or everyone owes. It is the maths behind splitting any bill, debt, or payout where the amount can go either way.



Rule

Dividing integers: divide the sizes, then use the sign rule.

Same signs give a positive answer, and different signs give a negative answer. The size of the answer comes from dividing the numbers without their signs.

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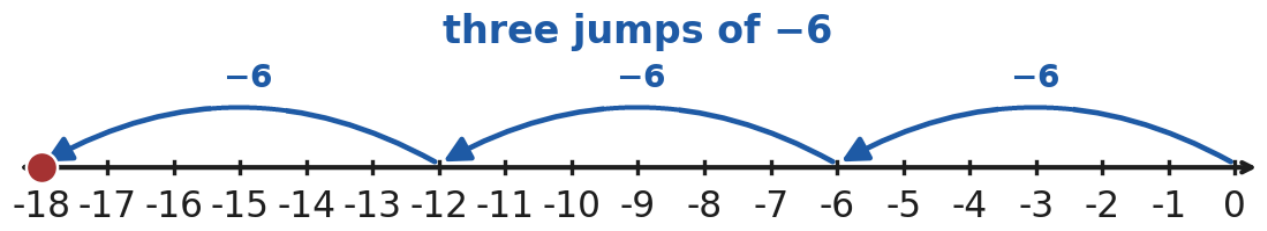
Worked examples

EXAMPLE 1

Q Work out (−18) ÷ 3



SOLUTION

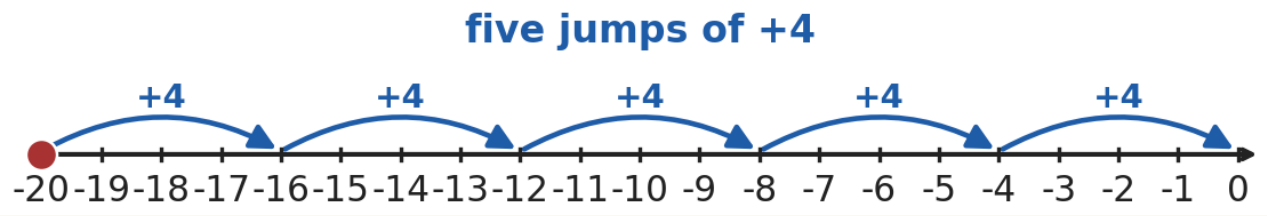
Divide the sizes: 18 ÷ 3 = 6

The signs differ, so the answer is negative.

So (−18) ÷ 3 = −6

EXAMPLE 2

Q Work out (−20) ÷ (−4)



SOLUTION

Divide the sizes: 20 ÷ 4 = 5

The signs are the same, so the answer is positive.

So (−20) ÷ (−4) = 5

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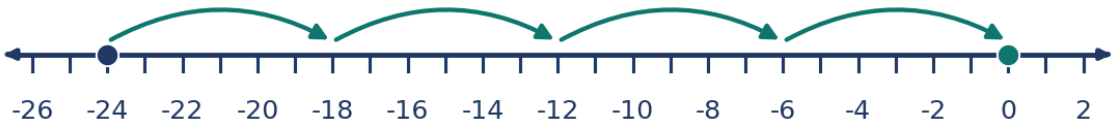
Practice questions

1 A debt of 24 dollars is shared equally between 4 friends. The number line shows the jumps. Each jump is the same size. How much does each friend owe?



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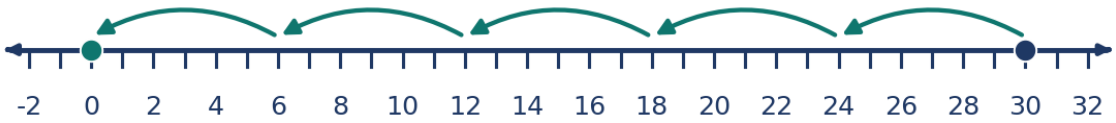
2 Work out 30 ÷ (-5) using the number line. The jumps are drawn. Each jump is the same size. What is the answer?



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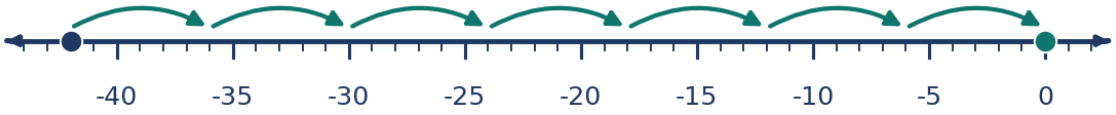
3 The number line shows -42 split into 7 equal jumps back to 0. How big is each jump? That is (-42) ÷ (-7).



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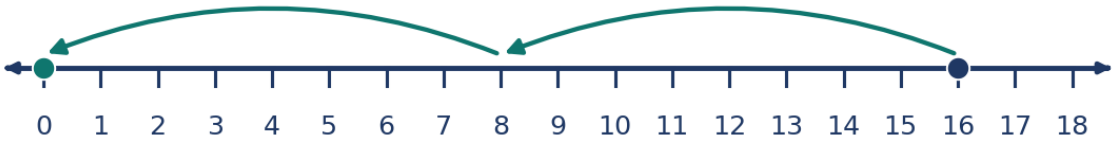
4 A teacher shares 16 pencils equally between 2 children. The number line shows one jump back to 0 for each child. How many pencils does each child get?



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5 What is $(-4) \div 0$?

- **A** 0
- **B** −4
- **C** Undefined
- **D** 4

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6 A debt of 100 dollars is paid back in 10 equal payments. The number line shows the payments back to 0. How big is each payment?



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7 Nothing is shared between 4 friends. What is $0 \div (-4)$?

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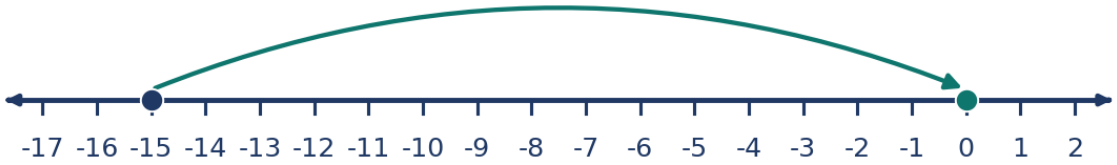
8 The number line shows -15 split into 1 jump back to 0. How big is the jump? That is $(-15) \div (-1)$.



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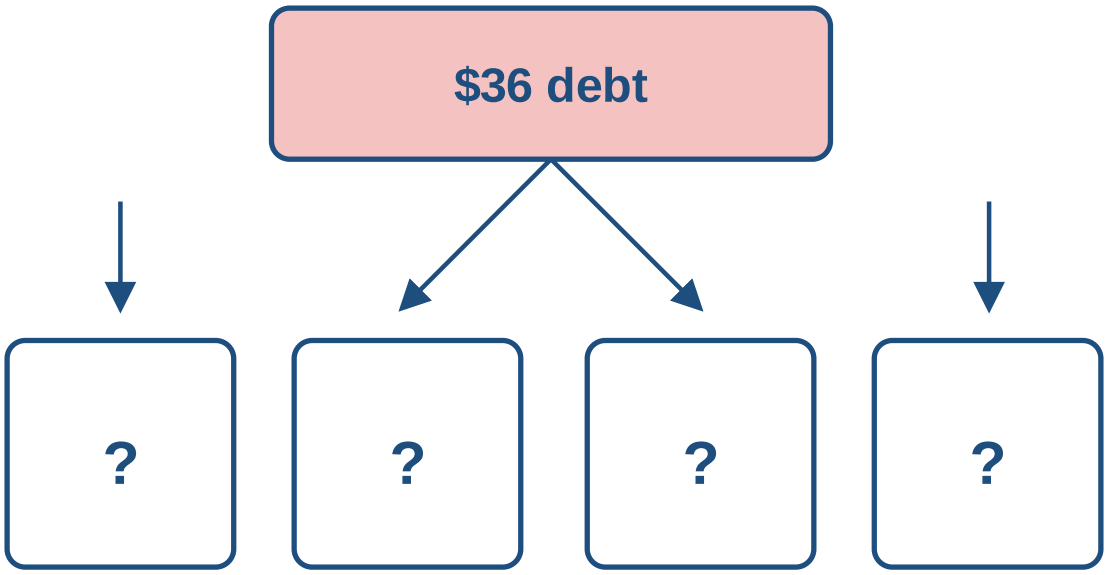
9 **Four friends share a debt of 36 dollars equally, as in the picture. How much does each person owe? Write the amount in dollars.**



each person owes

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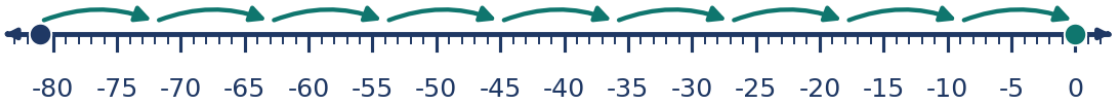
10 A submarine rises from -81 m to the surface in 9 equal stages. The number line shows the stages. How big is each stage?



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ANSWER KEY

1. -6

2. -6

3. 6

4. 8

5. Undefined

6. 10

7. 0

8. 15

9. -$9

10. 9

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