MATHEMATICS · GRADES 4-6

Finding the whole when a percentage is known

Difficulty level: Intermediate

Mathematics: Grades 4-6

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Overview of the concept

This is how you work backwards from a part you know. If a jacket on sale costs a known amount and you know the discount, you can find the original price it was marked down from. The same trick works for a test score, a tax amount, or any part that is a known percentage of a whole. It is the reverse of finding a percentage, and it is just as useful.



Rule

Finding the whole: if you know a percentage and the part it equals, divide the part by the percentage as a decimal to get the whole.

So if 20% of a number is 30, the number is $\frac{30}{0.20}$, which is 150.

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Worked examples

EXAMPLE 1

Q 20% of a number is 30. What is the number?

SOLUTION

This is a reverse percentage question, and the one rule to remember is to divide the part by the percentage as a decimal.

20% as a decimal is 0.20, so divide the part by the decimal: 30 ÷ 0.20 = 150

The number is 150. Check: 20% of 150 is 30.

EXAMPLE 2

Q A TV costs $160 in a 20% off sale. What was the original price?

SOLUTION

The sale price is not 20% of the original, it is what is left after taking 20% off, so it is 80% of the original price.

80% as a decimal is 0.80, so divide the part by the decimal: $160 ÷ 0.80 = $200

The original price was $200.

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Practice questions

1. 20% of the students walk to school. That is 30 students. How many students are in the school?

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2. 25% of a bag of marbles is 40 marbles. How many marbles are in the bag?

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3. 10% of a class got full marks. That is 12 students. How many students are in the class?

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4 Half of a box of pencils is 45 pencils. How many pencils are in the box?

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5 75% of a tank is 60 litres. How many litres does the tank hold?

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6 5% of a shop's pens are red. That is 3 pens. How many pens are there in all?

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7 30% of the tickets are sold. That is 90 tickets. How many tickets are there in all?

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8 A $240 deposit is 30% of the full price. What is the full price?

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9 60% of a book is 48 pages. How many pages are in the book?

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10 **A jacket costs $45 in a 25% off sale. What was the original price?**

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ANSWER KEY

1. 150

2. 160

3. 120

4. 90

5. 80

6. 60

7. 300

8. 800

9. 80

10. 60

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