Smart Cub Learning

11+ TOPIC PACK

Fractions, Decimals and Percentages

Maths

60 questions from warm-up to exam level, with worked solutions

SAMPLE

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How to do it

Fractions, decimals and percentages are three ways to write the same part of a whole. For example, 1/2, 0.5 and 50% all mean the same amount. Tests ask you to find parts of amounts and to switch between the three forms.

Learn the method

1. Read the question. Is it asking for a part of an amount, or for the same number written another way?
2. For equal fractions, multiply or divide the top and the bottom by the same number. To find a fraction of an amount, divide by the bottom, then multiply by the top. For a fraction of a fraction, multiply the tops, multiply the bottoms, then simplify.
3. For a percentage of an amount, find 10% by dividing by 10. Then build up: 50% is half, 25% is a quarter, and 5% is half of 10%.
4. To change the form: for a fraction to a decimal, divide the top by the bottom. For a decimal to a percentage, multiply by 100, so the digits move two places. For a fraction to a percentage, make the decimal first, then multiply by 100.
5. Check your answer is sensible. A part of an amount is smaller than the amount. A percentage like 0.3% or 300% is a sign that the digits moved the wrong way.

Worked example 1

Which fraction is equivalent to 2/3?

A 14/15 **B** 10/15 **C** 2/15 **D** 11/15

How to work it out

1. Multiply the top and the bottom by the same number.
2. 15 is 3 × 5, so multiply the top by 5 too: 2 × 5 = 10.
3. So 2/3 = 10/15.
4. Equal fractions show the same amount of a whole.

The answer is B: 10/15

Worked example 2

Write 6/10 as a decimal.

A 0.06 **B** 0.61 **C** 0.6 **D** 0.006

How to work it out

1. 6/10 is 6 tenths, which is 0.6.
2. So 6/10 = 0.6.

The answer is C: 0.6

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Worked example 7
What is 1/6 of 1/4?

A 5/12 **B** 1/24 **C** 3/2 **D** 1/10

How to work it out

1. "Of" means multiply.
2. Multiply the tops and multiply the bottoms: 1 × 1 = 1 and 6 × 4 = 24.
3. So the answer is 1/24.

The answer is B: 1/24

★ Top Tip

Learn the common matches by heart: 1/2 = 0.5 = 50%, 1/4 = 0.25 = 25%, 3/4 = 0.75 = 75%, 1/10 = 0.1 = 10%.

▲ Watch Out

- Changing only the top or only the bottom of a fraction makes a different fraction. Do the same thing to both.
- When you divide by the bottom, do not stop there. You must still multiply by the top number to finish.
- When you change a decimal to a percentage, the digits move two places. 0.3 is 30%, not 3% and not 300%.

Exam Tip

Cross out the options that are clearly too big or too small first. Three quarters of an amount is smaller than the amount. 0.3 is never 300%.

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Key words

numerator	The top number of a fraction. It says how many parts you have.
denominator	The bottom number of a fraction. It says how many equal parts the whole is cut into.
equivalent fractions	Fractions that look different but show the same amount, like 1/2 and 4/8.
simplify	Make a fraction simpler by dividing the top and the bottom by the same number.
decimal	A number with a decimal point, like 0.75, that can show a part of a whole.
percentage	A part out of 100. The sign % means 'out of 100'.

Part 1 Warm up

15 questions. Circle the letter of your answer. Use spare paper for your working.

1 Which fraction is equivalent to 3/7?

A 31/35 **B** 16/35 **C** 3/35 **D** 15/35

2 Which fraction is equivalent to 7/8?

A 13/16 **B** 8/7 **C** 14/16 **D** 15/16

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24 What is 2/5 of 85?

A 17 **B** 34 **C** 170 **D** 51

25 What is 3/4 of 132?

A 99 **B** 396 **C** 44 **D** 33

26 What is 80% of 125?

A 25 **B** 1000 **C** 100 **D** 80

27 What is 25% of 156?

A 390 **B** 117 **C** 25 **D** 39

28 What is 10% of 240?

A 24 **B** 240 **C** 10 **D** 216

29 What is 7/10 of 1/3?

A 1/30 **B** 10/21 **C** 7/13 **D** 7/30

30 What is 3/7 of 1/4?

A 1/7 **B** 3/11 **C** 3/28 **D** 1/28

Score: _____ / 15

Part 3 Stretch

15 questions. Circle the letter of your answer. Use spare paper for your working.

31 Which fraction is equivalent to 16/17?

A 16/34 **B** 33/34 **C** 32/34 **D** 32/17

32 Which fraction is equivalent to 12/14?

A 12/42 **B** 36/14 **C** 40/42 **D** 36/42

33 Which fraction is equivalent to 13/15?

A 25/30 **B** 26/15 **C** 26/30 **D** 28/30

34 Write 3/8 as a percentage.

A 5% **B** 62.5% **C** 0.375% **D** 37.5%

35 Write 2/16 as a percentage.

A 6.25% **B** 0.125% **C** 125% **D** 12.5%

36 What is 2/5 of 265?

A 530 **B** 106 **C** 53 **D** 159

37 What is 5/8 of 264?

A 165 **B** 33 **C** 99 **D** 1320

38 What is 3/8 of 208?

A 624 **B** 78 **C** 26 **D** 130

39 What is 4/5 of 230?

A 226 **B** 184 **C** 46 **D** 920

40 What is 70% of 460?

A 138 **B** 70 **C** 322 **D** 3220

41 What is 45% of 440?

A 198 **B** 1980 **C** 45 **D** 242

42 What is 35% of 400?

A 35 **B** 140 **C** 260 **D** 1400

43 What is 6/7 of 1/4?

A 3/14 **B** 1/28 **C** 17/28 **D** 6/11

44 What is 3/5 of 7/8?

A 11/40 **B** 59/40 **C** 21/13 **D** 21/40

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