

KS3 MATHS · YEARS 7-9

KS3 Maths foundations practice pack

Original questions across number, algebra, ratio, geometry and data. Use the worked answers to identify a method that needs more practice.

How to use this pack

Attempt the questions without searching for an answer. Show working where appropriate. Check the answer section only after completing a full section.

SECTION 1

Number, ratio and algebra

Show enough working for someone else to follow your method.

1. Calculate $-7 + 3 \times 5$.

2. Write 84 as a product of prime factors.

3. Simplify $4a + 3b - 2a + 5b$.

4. Solve $5x - 7 = 28$.

5. A drink uses concentrate and water in the ratio 2:7. How much water is needed with 180 ml of concentrate?

SECTION 2

Geometry and data

Draw a labelled sketch where it helps and include units.

1. The angles in a triangle are x , $2x$ and $3x$. Find all three angles.

2. A cuboid measures 8 cm by 5 cm by 3 cm. Find its volume.

3. The mean of five numbers is 14. Four numbers are 8, 11, 16 and 19. Find the fifth number.

4. A fair six-sided die is rolled. Find the probability of rolling a prime number.

SECTION 3

Percentages, graphs and probability

State the multiplier or graph feature before carrying out the calculation.

1. Increase £160 by 12.5%.

2. After a 20% discount, a game costs £36. Find its original price.

3. A straight line passes through (1, 5) and (5, 17). Find its gradient.

4. A bag contains 5 red, 3 blue and 2 green counters. One counter is chosen at random. Find the probability it is not blue.

ANSWERS AND METHODS

Check the method, not only the final answer

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| 1. 8. Multiplication first: $3 \times 5 = 15$; then $-7 + 15 = 8$. |
| 2. $2^2 \times 3 \times 7$. $84 = 2 \times 42 = 2 \times 2 \times 21 = 2^2 \times 3 \times 7$. |
| 3. $2a + 8b$. Combine like terms only: $4a - 2a$ and $3b + 5b$. |
| 4. $x = 7$. Add 7 to both sides to get $5x = 35$, then divide by 5. |
| 5. 630 ml. Two ratio parts equal 180 ml, so one part is 90 ml. Water is seven parts: 7×90 . |
| 1. 30° , 60° , 90° . $x + 2x + 3x = 180^\circ$, so $6x = 180^\circ$ and $x = 30^\circ$. |
| 2. 120 cm^3 . Volume = $8 \times 5 \times 3$. |
| 3. 16. The total is $5 \times 14 = 70$. The known total is 54, so the missing number is 16. |
| 4. $\frac{1}{2}$. The prime outcomes are 2, 3 and 5: three favourable outcomes out of six. |
| 1. £180. 12.5% is one eighth; one eighth of £160 is £20, so the increased amount is £180. |
| 2. £45. The discounted price is 80% of the original. Divide £36 by 0.8. |
| 3. 3. Gradient = change in $y \div$ change in $x = (17 - 5) \div (5 - 1) = 12 \div 4$. |
| 4. $\frac{7}{10}$. There are 10 counters and 7 are not blue, so the probability is 7 out of 10. |