

Year 8 Maths — Mixed Practice

20 Questions · Written by Dennis Mihailov

Part A — Guided Questions

Each question below has a full worked solution. Read through the method carefully before trying Part B.

1. Factorise $48x - 30$

Find the HCF of 48 and 30.

$$48 = 6 \times 8, \quad 30 = 6 \times 5 \quad \Rightarrow \quad \text{HCF} = 6$$

Take 6 outside the bracket:

$$48x - 30 = 6(8x - 5)$$

Check: $6 \times 8x = 48x$ ✓ $6 \times 5 = 30$ ✓

2. Simplify $x^4 \times x^2 \times y^3 \times y$

When multiplying powers with the same base, **add** the indices.

$$x^4 \times x^2 = x^{4+2} = x^6 \quad y^3 \times y^1 = y^{3+1} = y^4$$

$$\text{Answer} = \mathbf{x^6y^4}$$

3. Work out $5.307 - 3.85$

Line up the decimal points and subtract column by column:

$$\begin{array}{r} 5.307 \\ -3.850 \\ \hline 1.457 \end{array}$$

$$\text{Answer} = \mathbf{1.457}$$

4. Work out $\frac{7}{12} - \frac{1}{4}$

Find a common denominator. LCM of 12 and 4 is 12.

$$\frac{1}{4} = \frac{3}{12} \quad \Rightarrow \quad \frac{7}{12} - \frac{3}{12} = \frac{4}{12} = \frac{\mathbf{1}}{\mathbf{3}}$$

5. Find the **nth term** of the sequence: $-1, 1, 3, 5, \dots$

Step 1: Common difference $= 1 - (-1) = 2$, so the nth term contains $2n$.

Step 2: When $n = 1$: $2(1) = 2$, but we need -1 , so adjust by -3 .

Step 3:

$$\text{nth term} = \mathbf{2n - 3}$$

Check: $n = 1$: $2(1) - 3 = -1 \checkmark$ $n = 2$: $2(2) - 3 = 1 \checkmark$

6. Work out $360 \div 0.8$

Multiply both numbers by 10 to remove the decimal:

$$360 \div 0.8 = 3600 \div 8 = \mathbf{450}$$

7. Solve $4(3x - 2) = 5x + 22$

Step 1: Expand: $12x - 8 = 5x + 22$

Step 2: Collect x terms: $12x - 5x = 22 + 8 \Rightarrow 7x = 30$

Step 3: Divide: $x = \frac{30}{7} = \mathbf{4\frac{2}{7}}$

8. Divide £1 200 in the ratio 3 : 5

Step 1: Total parts: $3 + 5 = 8$

Step 2: One part: $1200 \div 8 = \text{£}150$

Step 3: $3 \times \text{£}150 = \text{£}\mathbf{450}$ and $5 \times \text{£}150 = \text{£}\mathbf{750}$

Check: $\text{£}450 + \text{£}750 = \text{£}1200 \checkmark$

9. Express $\frac{7}{20}$ as a percentage

Multiply by 100:

$$\frac{7}{20} \times 100 = \frac{700}{20} = \mathbf{35\%}$$

Alternatively: $\frac{7}{20} = \frac{35}{100} = 35\%$

10. What is the gradient and y-intercept of: $y = 3 - 2x$?

Rewrite as $y = mx + c$:

$$y = -2x + 3 \quad \Rightarrow \quad \text{Gradient} = \mathbf{-2}, \quad \text{y-intercept} = \mathbf{3}$$

Part B — Challenge Questions

Answer these on paper showing all your working. Use Part A to help you with the methods.

11. **Factorise** $35y - 56$

12. **Simplify** $a^5 \times a^3 \times b^2 \times b^4$

13. **Work out** $8.042 - 5.67$

14. **Work out** $\frac{5}{6} - \frac{1}{3}$

15. Find the **nth term** of the sequence: 4, 7, 10, 13, ...

16. **Work out** $540 \div 0.6$

17. **Solve** $3(2x + 5) = 4x + 19$

18. **Divide** £840 in the ratio 2 : 5

19. **Express** $\frac{9}{25}$ as a percentage

20. What is the **gradient** and **y-intercept** of: $y = 5 - 4x$?
