

GCSE Maths

Mark Scheme
Available here:



Mixed Algebra Practice *2nd Edition*

Simplifying
Expanding and Factorising
Laws of Indices
Solving Equations
Algebraic Fractions
Surds
Inequalities

www.advancemaths.com/gcse-maths/mixed-algebra-practice/

Name:

Score:

Time:

Instructions

- Use black or blue ball-point pen.
- Answer all the questions in the spaces provided.

Information

- The marks for each question are shown in the circles.
- You are allowed a calculator for this test. We recommend the Casio Classwiz model.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Q	Score
1	/6
2	/6
3	/7
4	/7
5	/9
6	/8
7	/8
8	/6
9	/8
10	/7

Challenge Questions

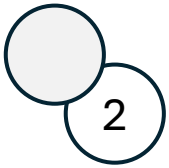
11	/4
12	/4

Mixed Algebra Practice



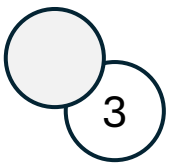
1. a) Expand and Simplify:

$$5(3x - 1) + 4(2 - 5x) =$$

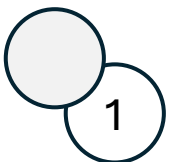


b) i) Factorise: $x^2 + 9x + 20$

ii) Hence solve: $x^2 + 9x + 21 = 1$



c) Simplify fully: $\frac{a^9 \times a^3}{a}$

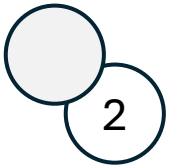


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2. a) Evaluate:

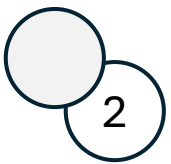
$$\pi^0 =$$

$$\sqrt{\frac{64}{9}} =$$

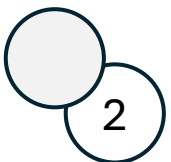


b) Factorise fully:

$$24a^7b - 40a^2b^8 =$$



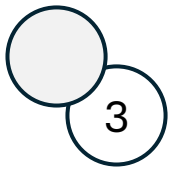
c) Simplify fully $(3x^3y^2z)^4 =$



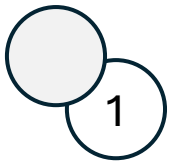
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3. a) Expand:

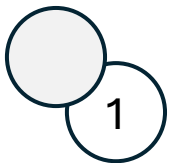
$$(5x + 3y^4)(2y^2 - 3x^3) =$$



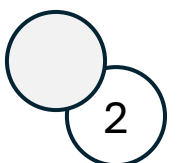
b) Factorise: $c^2 - 36 =$



c) Simplify fully: $(5a - 3b)^0 =$



d) Solve $\frac{4x+2}{5} < 10$

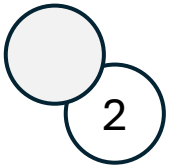


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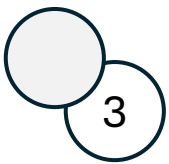
4. a) Expand and Simplify:

$$9x(x - 2) - 2x(5 - 3x) =$$

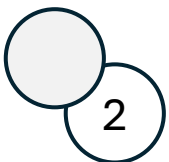


b) i) Factorise: $x^2 + x - 6$

ii) Hence solve: $x^2 + x = 6$



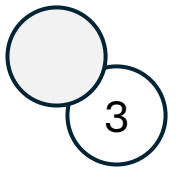
c) Simplify fully: $\frac{(c^6)^5}{c^3 \times c}$



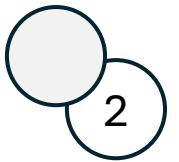
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5. a) Expand:

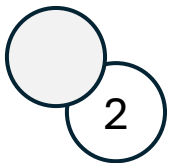
$$(4x - 5y^2)(x^3 - 10y^2) =$$



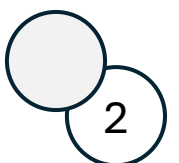
b) Factorise: $144 - e^2 =$



c) Simplify fully: $\sqrt{25a^8b^{120}} =$



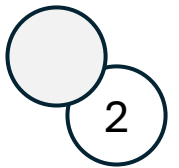
d) Solve: $\frac{x}{4} + \frac{x}{6} = 200$



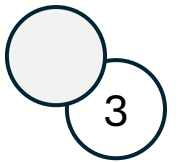
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6. a) Simplify fully:

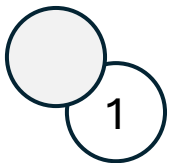
$$\sqrt{\frac{80y^{11}}{5x^8y^5}} =$$



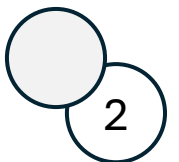
b) Expand fully: $7x(10 - 3x)(x - 8) =$



c) Simplify fully: $(4m^7y)^2 =$



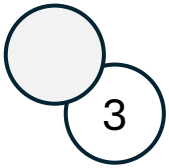
d) Solve: $9 - (5 - 2x) = -6$



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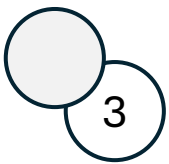
7. a) Expand and Simplify:

$$(b - 5)^3 =$$



b) i) Factorise: $y^2 + 7y + 10$

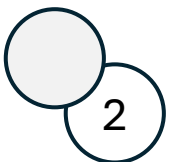
ii) Hence, simplify fully: $\frac{y^3 + 7y^2 + 10y}{2y + 4} =$



c) Look at the following equation:

$$\frac{2^4 \times 16}{\sqrt{2}} = 4^{x-1}$$

What is the value of n ?

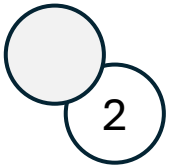


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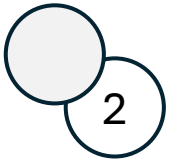


8. a) Expand and Simplify:

$$6b(7b^2 - 5x) - 2x(b - 2) =$$

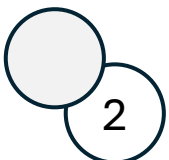


b) i) Factorise: $m^2 - \frac{16}{9} =$



c) List the positive integers which satisfy:

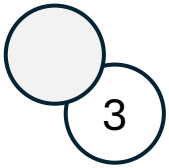
$$\frac{8 - 3x}{7} > -3$$



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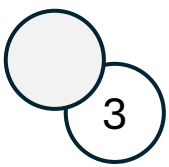


9. a) Solve: $\frac{3x-5}{8} - \frac{x}{3} = 10$



b) i) Factorise: $10x^2 - 13x - 3 =$

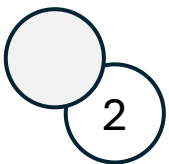
ii) Hence, simplify fully: $\frac{15x + 3}{10x^2 - 13x - 3} =$



c) Look at the following equation:

$$\frac{3^{20} \times 27^2}{3\sqrt{3}} = 9^n$$

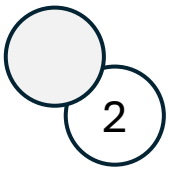
What is the value of n ?



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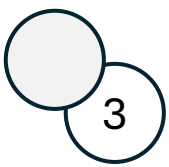


10. a) Simplify: $\frac{50x^3y^5}{2x^8y} =$



b) i) Factorise: $16y^2 - 100 =$

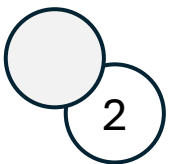
ii) Hence, simplify fully: $\frac{16y^2 - 100}{8y + 20} =$



c) The even numbers between 6 to 31 are raised to the power zero and added together.

What is the value of the sum?

$$6^0 + 8^0 + 10^0 + \dots + 30^0 =$$



Challenge Questions!

11. Simplify fully:

$$\frac{x^3 - 9x}{x^2 + 3x} \times \frac{x}{x^2 - 6x + 9} =$$

12. Expand and simplify:

$$(x - 9)(x - 5)^2 - (2x - 3)^2 =$$

