



Algebra 2

TESTS MASTERY OF ALGEBRA 1 • 20 ITEMS • 70-85 MINUTES • CALCULATOR ON SECTION B ONLY

This diagnostic checks whether the core of a first algebra course - equation solving, linear modelling, exponents and data reasoning - is reliable under awkward numbers and negative signs. Items favour structural understanding over recall.

BEFORE YOU BEGIN

No calculator unless a question says otherwise. Show your working - the method tells us more than the answer.
Leave a question blank rather than guessing. A blank tells us it is unfamiliar; a wrong answer tells us what is believed.
Work alone. Nobody should explain the mathematics or suggest a method.
Stop and resume later if you tire. This is a picture of understanding, not a race.

SECTION A Multiple choice

10 items

Choose one answer. If you are unsure, leave it blank rather than guessing.

01 Solve: $(x/3) - 4 = 2$

- A) $x = 18$
- B) $x = 6$
- C) $x = -6$
- D) $x = 2$

02 Which line is parallel to $y = 3x - 4$?

- A) $y = 3x + 1$
- B) $y = -3x - 4$
- C) $y = (\frac{1}{3})x - 4$
- D) $y = -(\frac{1}{3})x + 4$

03 Simplify: $(x^6)/(x^2)$

- A) x^4
- B) x^3
- C) x^8
- D) x^{12}



- 04 Factorise: $x^2 - 9$
- A) $(x-3)(x+3)$
 - B) $(x-3)^2$
 - C) $(x-9)(x+1)$
 - D) $x(x-9)$
- 05 The function $f(x) = 2x + 1$. What is $f(3)$?
- A) 7
 - B) 6
 - C) $2x+1$
 - D) 3
- 06 Which describes the solution to $2x + 6 = 2(x + 3)$?
- A) Infinitely many solutions
 - B) $x = 0$
 - C) No solution
 - D) $x = 3$
- 07 A population doubles each year from 50. Which models it after t years?
- A) $50 \cdot 2^t$
 - B) $50t^2$
 - C) $50 + 2t$
 - D) $2 \cdot 50^t$
- 08 Solve the inequality: $-2x > 6$
- A) $x < -3$
 - B) $x > -3$
 - C) $x < 3$
 - D) $x > 3$
- 09 Which is the y-intercept of $2x + 4y = 8$?
- A) (0, 2)
 - B) (4, 0)
 - C) (0, 8)
 - D) (2, 0)



- 10 A scatter plot shows points falling from upper left to lower right. The correlation is
- A) Negative
 - B) Positive
 - C) Zero
 - D) Impossible to tell

SECTION B Student solving

6 items

Show your working. We are reading the method, not only the answer.

- 11 Solve and check: $(2x - 1)/3 = (x + 4)/2$

- 12 Expand and simplify: $(2x - 3)(x + 5)$



- 13 A taxi charges \$3 plus \$1.50 per mile. Write a formula for cost C after m miles, then find the miles for a \$18 fare.

- 14 Factorise fully: $x^2 + 7x + 12$

- 15 Solve the system by any method: $y = 2x - 1$, $3x + y = 9$



- 16 The table shows x : 1, 2, 3, 4 and y : 5, 8, 11, 14. Is the relationship linear? Justify, then write the rule.

SECTION C Error analysis

4 items

Each shows work containing a mistake. Find the FIRST incorrect step, say what the student believed, and give the correct answer.

- 17 Find the first incorrect step and correct it.

$$\begin{aligned}-2x &> 6 \\ x &> -3\end{aligned}$$

- 18 Find the first incorrect step and give the correct expansion.

$$\begin{aligned}(2x - 3)(x + 5) \\ = 2x^2 - 15\end{aligned}$$

- 19 Find the error and give the correct simplification.

$$\begin{aligned}(x + 4)/4 \\ = x\end{aligned}$$

- 20 A student says these lines are perpendicular. Explain why not, and give a line that is.

$$\begin{aligned}y &= 2x + 1 \\ y &= -2x + 3\end{aligned}$$

Student: the slopes are opposite,
so the lines are perpendicular.

What happens next

Bring this completed sheet to your consultation. A tutor reads it alongside a short conversation with the student and any school work you choose to share, then recommends a level. No placement is ever decided by a score on its own, and no student is placed without a tutor's approval.