

Algebra 1 Practice Worksheet

Fifty questions across the full Algebra 1 sequence: lines, inequalities, systems, exponents, factoring, quadratics, functions, sequences and data. Questions 45 to 50 ask for written working. Fully reasoned solutions begin after the last question.

QUESTIONS	50	MULTIPLE CHOICE	44	WRITTEN	6
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Instructions

Work without a calculator unless a question needs one. Show enough working that you could explain any line aloud. Circle anything you guessed — those are the questions worth a tutoring session.

- 1** A line passes through (2, 5) and (6, 13). What is its slope?
A) $1/2$
B) 2
C) 4
D) 8
- 2** Which equation has slope -3 and passes through (0, 7)?
A) $y = 7x - 3$
B) $y = -3x + 7$
C) $y = -3x - 7$
D) $y = 3x + 7$
- 3** Solve for x: $5(x - 2) = 3x + 4$.
A) $x = 3$
B) $x = 7$
C) $x = 9$
D) $x = 14$
- 4** A phone plan costs \$30 per month plus \$0.10 per gigabyte. Which model gives cost c for g gigabytes?
A) $c = 0.10g + 30$
B) $c = 30g + 0.10$
C) $c = 30.10g$
D) $c = 0.10(g + 30)$
- 5** What is the y-intercept of $2x + 5y = 20$?
A) (0, 4)
B) (0, 10)
C) (4, 0)
D) (0, 20)
- 6** A line is perpendicular to $y = 2x + 1$. What is its slope?
A) 2
B) -2
C) $1/2$
D) $-1/2$
- 7** Which describes the line through (1, 4) with slope 3, in point-slope form?
A) $y - 4 = 3(x - 1)$
B) $y - 1 = 3(x - 4)$
C) $y + 4 = 3(x + 1)$
D) $y = 3x + 4$
- 8** Solve: $-3x + 4 > 19$.
A) $x > -5$
B) $x < -5$
C) $x > 5$
D) $x < 5$

- 9** Solve: $|x - 3| = 7$.
A) $x = 10$ only
B) $x = -4$ only
C) $x = 10$ or $x = -4$
D) No solution
- 10** Solve: $|x| < 4$.
A) $x < 4$
B) $x > -4$
C) $-4 < x < 4$
D) $x < -4$ or $x > 4$
- 11** Solve the system: $y = 2x - 1$ and $y = -x + 8$.
A) (3, 5)
B) (5, 3)
C) (2, 3)
D) (1, 7)
- 12** How many solutions does $y = 4x + 1$ and $y = 4x - 6$ have?
A) None
B) Exactly one
C) Exactly two
D) Infinitely many
- 13** Solve: $x + y = 10$ and $x - y = 2$.
A) (6, 4)
B) (4, 6)
C) (5, 5)
D) (8, 2)
- 14** How many solutions does $2x + 4y = 8$ and $x + 2y = 4$ have?
A) None
B) Exactly one
C) Infinitely many
D) Exactly two
- 15** Simplify: $(3x^2)(4x^5)$.
A) $7x^7$
B) $12x^7$
C) $12x^{10}$
D) $7x^{10}$
- 16** Simplify: x^8 / x^3 .
A) x^5
B) x^{11}
C) x^{24}
D) x^2
- 17** Simplify: $(2x^3)^4$.
A) $8x^{12}$
B) $16x^7$
C) $16x^{12}$
D) $2x^{12}$
- 18** Evaluate: $5^0 + 3^{-1}$.
A) 0
B) $1/3$
C) $4/3$
D) 1
- 19** Factor completely: $x^2 - 25$.
A) $(x - 5)^2$
B) $(x + 5)(x - 5)$
C) $(x - 25)(x + 1)$
D) Cannot be factored
- 20** Factor completely: $x^2 + 7x + 12$.
A) $(x + 3)(x + 4)$
B) $(x + 2)(x + 6)$
C) $(x + 12)(x + 1)$
D) $(x - 3)(x - 4)$
- 21** Factor completely: $x^2 - 4x - 21$.
A) $(x - 7)(x + 3)$
B) $(x + 7)(x - 3)$
C) $(x - 21)(x + 1)$
D) $(x - 7)(x - 3)$
- 22** Expand: $(x + 6)^2$.
A) $x^2 + 36$
B) $x^2 + 12x + 36$
C) $x^2 + 6x + 36$
D) $x^2 + 12x + 12$

- 23** Factor completely: $3x^2 + 12x$.
A) $3(x^2 + 4x)$
B) $3x(x + 4)$
C) $x(3x + 12)$
D) $3x(x + 12)$
- 24** Solve: $x^2 - 6x + 8 = 0$.
A) $x = 2$ or $x = 4$
B) $x = -2$ or $x = -4$
C) $x = 1$ or $x = 8$
D) $x = 3$ only
- 25** For $y = x^2 - 8x + 3$, what is the axis of symmetry?
A) $x = -8$
B) $x = -4$
C) $x = 3$
D) $x = 4$
- 26** How many real solutions does $x^2 + 2x + 5 = 0$ have?
A) None
B) One
C) Two
D) Cannot be determined
- 27** Solve: $x^2 = 49$.
A) $x = 7$
B) $x = -7$
C) $x = 7$ or $x = -7$
D) $x = 24.5$
- 28** What is the vertex of $y = (x - 3)^2 + 5$?
A) (3, 5)
B) (-3, 5)
C) (3, -5)
D) (5, 3)
- 29** Solve: $x^2 + 5x = 0$.
A) $x = 0$ or $x = -5$
B) $x = 5$ only
C) $x = 0$ only
D) $x = -5$ only
- 30** The discriminant of a quadratic is 0. How many real solutions are there?
A) None
B) Exactly one
C) Exactly two
D) Infinitely many
- 31** If $f(x) = 3x - 4$, what is $f(6)$?
A) 10
B) 14
C) 18
D) 22
- 32** If $f(x) = x^2 + 1$, what is $f(-3)$?
A) -8
B) 10
C) -10
D) 8
- 33** What is the average rate of change of $f(x) = x^2$ from $x = 1$ to $x = 4$?
A) 3
B) 5
C) 15
D) 17
- 34** The first term of an arithmetic sequence is 7 with common difference 5. What is the 10th term?
A) 47
B) 52
C) 57
D) 62
- 35** A geometric sequence starts at 3 and triples each step. What is the 4th term?
A) 27
B) 81
C) 12
D) 9
- 36** A car worth \$20,000 loses 10% of its value each year. Which model gives its value after x years?
A) $y = 20000(0.90)^x$
B) $y = 20000(1.10)^x$
C) $y = 20000 - 0.10x$
D) $y = 20000(0.10)^x$

37 Which function represents growth?

- A) $y = 5(0.4)^x$
- B) $y = 5(1.4)^x$
- C) $y = 5(0.9)^x$
- D) $y = 5(1)^x$

38 What is the domain of $f(x) = x^2$?

- A) $x \geq 0$
- B) All real numbers
- C) $x > 0$
- D) $x \neq 0$

39 Data set: 4, 7, 7, 9, 28. Which statement is true?

- A) The mean is less than the median
- B) The mean equals the median
- C) The mean is greater than the median
- D) The range is 9

40 Which measure is least affected by an outlier?

- A) Mean
- B) Median
- C) Range
- D) Sum

41 A scatterplot's points fall close to a line sloping downward. This shows:

- A) Strong positive correlation
- B) Strong negative correlation
- C) No correlation
- D) Causation

42 The median of 3, 8, 9, 15 is:

- A) 8
- B) 8.5
- C) 9
- D) 11

43 Simplify: $2(x + 3) - 4(x - 1)$.

- A) $-2x + 10$
- B) $-2x + 2$
- C) $6x + 10$
- D) $2x - 10$

44 Solve for y : $3x + 2y = 12$.

- A) $y = 12 - 3x$
- B) $y = (12 - 3x)/2$
- C) $y = 6 - 3x$
- D) $y = (3x - 12)/2$

45 A tutoring service charges a \$25 registration fee plus \$18 per session. Write an equation for the total cost C after n sessions, then find the cost of 12 sessions. Show each step.

46 Solve $2x + 3y = 12$ and $x - y = 1$ using any method. State which method you chose and why.

47 Factor $2x^2 + 7x + 3$ completely and explain how you found the factors.

48 A population of 500 grows 8% per year. Write the exponential model and explain why the value after 2 years is not $500 + 2(40)$.

49 The line through $(0, 2)$ and $(4, 14)$ models a savings balance in dollars after x weeks. Find the equation and interpret both the slope and the intercept in context.

- 50** A rectangle's length is 3 more than twice its width. Its area is 54. Write a quadratic equation for the width and solve it, discarding any answer that makes no sense.

Answer key

Direct answers only, in question order. Work the set first, then check.

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|------------------------------------|----------------------------|-----------------------------------|--|--------------------------------------|
| 1. B) 2 | 2. B) $y = -3x + 7$ | 3. B) $x = 7$ | 4. A) $c = 0.10g + 30$ | 5. A) (0, 4) |
| 6. D) -1/2 | 7. A) $y - 4 = 3(x - 1)$ | 8. B) $x < -5$ | 9. C) $x = 10$ or $x = -4$ | 10. C) $-4 < x < 4$ |
| 11. A) (3, 5) | 12. A) None | 13. A) (6, 4) | 14. C) Infinitely many | 15. B) $12x^7$ |
| 16. A) x^5 | 17. C) $16x^{12}$ | 18. C) $4/3$ | 19. B) $(x + 5)(x - 5)$ | 20. A) $(x + 3)(x + 4)$ |
| 21. A) $(x - 7)(x + 3)$ | 22. B) $x^2 + 12x + 36$ | 23. B) $3x(x + 4)$ | 24. A) $x = 2$ or $x = 4$ | 25. D) $x = 4$ |
| 26. A) None | 27. C) $x = 7$ or $x = -7$ | 28. A) (3, 5) | 29. A) $x = 0$ or $x = -5$ | 30. B) Exactly one |
| 31. B) 14 | 32. B) 10 | 33. B) 5 | 34. B) 52 | 35. B) 81 |
| 36. A) $y = 20000(0.90)^x$ | 37. B) $y = 5(1.4)^x$ | 38. B) All real numbers | 39. C) The mean is greater than the median | 40. B) Median |
| 41. B) Strong negative correlation | 42. B) 8.5 | 43. A) $-2x + 10$ | 44. B) $y = (12 - 3x)/2$ | 45. C = $18n + 25$; \$241 |
| 46. (3, 2) | 47. $(2x + 1)(x + 3)$ | 48. $y = 500(1.08)^x$; about 583 | 49. $y = 3x + 2$ | 50. $2w^2 + 3w - 54 = 0$; $w = 4.5$ |

Error log

Bring this page to your next session so the tutor can start from what actually blocked you.

Questions I answered incorrectly:

For each one: was it the concept, the setup, or the arithmetic?

The single topic I want to start the next session with:
