

ACT Math Practice Test 1

Original full-length practice · 45 questions · 50 minutes

Unofficial practice material aligned to the current ACT Math section.

Directions. Set a 50-minute timer. Select one answer for each item. The current ACT Math section uses four answer choices. A calculator may be used in accordance with ACT's current calculator policy. Try to answer every question, mark difficult items, and return to them if time remains. Suggested pacing is about one minute per question. This original practice test is not an official ACT test and is not endorsed by ACT.

Name: _____

Date: _____

Answer grid

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45

Practice Questions

- What is the value of $2(3^2) - 5$?
 A. 9 B. 13 C. 18 D. 23
- What is $\frac{3}{4} + \frac{2}{3}$?
 A. $1\frac{1}{12}$ B. $1\frac{1}{4}$ C. $1\frac{5}{12}$ D. $1\frac{7}{12}$
- A jacket costs \$240 before a discount. What is 15% of the original price?
 A. \$24 B. \$36 C. \$40 D. \$204
- A total of 64 tickets are divided between two groups in the ratio 3 : 5. How many tickets go to the larger group?
 A. 24 B. 32 C. 40 D. 48
- What is $(-2)^3 + 3^2$?
 A. 1 B. -17 C. 17 D. -1
- What is $\sqrt{144} + \sqrt{25}$?
 A. 15 B. 17 C. 19 D. 169
- If $4x - 7 = 17$, what is x ?
 A. 4 B. 5 C. 6 D. 7

8. Which inequality is equivalent to $3(2x + 1) \leq 15$?
- A. $x \geq 2$ B. $x \leq 2$ C. $x \leq 7$ D. $x \geq 7$
9. If $x + y = 11$ and $x - y = 3$, what is x ?
- A. 4 B. 7 C. 8 D. 11
10. What is the slope of the line through $(2, 3)$ and $(6, 11)$?
- A. $\frac{1}{2}$ B. 2 C. 4 D. 8
11. For $y = 3x - 4$, what is y when $x = 5$?
- A. 7 B. 9 C. 11 D. 15
12. If $f(x) = x^2 - 2x$, what is $f(4)$?
- A. 4 B. 8 C. 12 D. 16
13. If $g(x) = 2x + 1$ and $f(x) = x^2$, what is $f(g(2))$?
- A. 9 B. 16 C. 20 D. 25
14. What is the smaller solution of $x^2 - 7x + 12 = 0$?
- A. 3 B. 4 C. -3 D. -4
15. If $\frac{2}{x-1} = 1$, what is x ?
- A. 1 B. 2 C. 3 D. 4
16. Simplify $3x^2 - 2x + 5x - 6x^2$.
- A. $-3x^2 + 3x$ B. $3x^2 + 3x$ C. $-3x^2 - 7x$ D. $9x^2 + 3x$
17. An arithmetic sequence begins 7, 11, 15, ... What is its 15th term?
- A. 59 B. 61 C. 63 D. 67
18. What is $\frac{2^5 \cdot 2^3}{2^4}$?
- A. 4 B. 8 C. 16 D. 32
19. Two angles of a triangle measure 52° and 68° . What is the third angle?
- A. 50° B. 55° C. 60° D. 70°
20. A right triangle has legs of lengths 5 and 12. What is the hypotenuse?
- A. 12 B. 13 C. 15 D. 17
21. What is the circumference of a circle with radius 6?
- A. 6π B. 12π C. 18π D. 36π
22. A cylinder has radius 3 and height 4. What is its volume?
- A. 12π B. 24π C. 36π D. 48π

23. What is the distance between $(-1, 2)$ and $(2, 6)$?
- A. 4 B. 5 C. 6 D. 7
24. Two similar triangles have corresponding sides 4 and 10. If another side of the smaller triangle is 7, what is the matching side of the larger triangle?
- A. 14 B. 15 C. 17.5 D. 28
25. A rectangle has perimeter 34 units and length 10 units. What is its area?
- A. 60 B. 70 C. 80 D. 100
26. In a right triangle, the side adjacent to angle θ is 8 and the hypotenuse is 10. What is $\cos \theta$?
- A. $\frac{4}{5}$ B. $\frac{3}{4}$ C. $\frac{3}{5}$ D. $\frac{5}{2}$
27. In a right triangle, the side opposite angle θ is 5 and the hypotenuse is 13. What is $\sin \theta$?
- A. $\frac{5}{12}$ B. $\frac{5}{13}$ C. $\frac{12}{13}$ D. $\frac{13}{5}$
28. Two fair six-sided dice are rolled. What is the probability that their sum is 7?
- A. $\frac{1}{6}$ B. $\frac{1}{9}$ C. $\frac{1}{12}$ D. $\frac{7}{36}$
29. The mean of five numbers is 8. Four of the numbers are 6, 7, 8, and 9. What is the fifth number?
- A. 8 B. 9 C. 10 D. 11
30. What is the median of 2, 4, 7, 9, 12?
- A. 4 B. 7 C. 8 D. 9
31. What is the range of 3, 5, 6, 11?
- A. 6 B. 7 C. 8 D. 14
32. A bag contains 4 red, 5 blue, and 3 green tiles. What is the probability that one tile chosen at random is not red?
- A. $\frac{1}{3}$ B. $\frac{5}{12}$ C. $\frac{7}{12}$ D. $\frac{2}{3}$
33. A club has 5 members. How many different pairs can be selected?
- A. 5 B. 8 C. 10 D. 20
34. A 8-by-5 rectangle has a 2-by-2 square cut from one corner. What is the area of the remaining figure?
- A. 28 B. 32 C. 36 D. 40
35. A savings balance is \$200 and increases by 5% over one period. What is the new balance?
- A. \$205 B. \$210 C. \$220 D. \$250
36. What is the maximum value of $f(x) = -(x - 3)^2 + 10$?
- A. 3 B. 7 C. 10 D. 13

37. Four notebooks cost \$6.40 at the same price per notebook. What is the cost of 7 notebooks?
- A. \$10.40 B. \$11.20 C. \$12.00 D. \$44.80
38. A cyclist rides 12 kilometers in 3 hours at a constant speed. How far will the cyclist ride in 2.5 hours at that speed?
- A. 8 km B. 9 km C. 10 km D. 15 km
39. The ratio of red to blue beads is 2 : 3. If there are 18 blue beads, how many red beads are there?
- A. 9 B. 12 C. 15 D. 27
40. A bag contains 3 red and 2 blue counters. Two counters are drawn without replacement. What is the probability both are blue?
- A. $\frac{1}{10}$ B. $\frac{1}{5}$ C. $\frac{2}{5}$ D. $\frac{1}{2}$
41. A principal of \$800 earns simple interest at 4% per year for 3 years. How much interest is earned?
- A. \$32 B. \$64 C. \$80 D. \$96
42. For $x \neq 3$, which expression is equivalent to $\frac{x^2 - 9}{x - 3}$?
- A. $x - 3$ B. $x + 3$ C. $x^2 + 3$ D. $x + 6$
43. For which values of x is $\sqrt{2x - 6}$ defined as a real number?
- A. $x \geq 3$ B. $x \leq 3$ C. $x > -3$ D. $x < -3$
44. If $\log_2 x = 4$, what is x ?
- A. 8 B. 12 C. 16 D. 32
45. The variables x and y are directly proportional. If $y = 15$ when $x = 3$, what is y when $x = 10$?
- A. 30 B. 40 C. 50 D. 60

Answer Key and Worked Explanations

Score one point for each correct answer. Your raw score is the number correct out of 45; this practice set does not convert raw scores to an official ACT score. Review explanations for missed and guessed questions, then choose one skill to revisit.

1. **B. 13** Evaluate the exponent first: $3^2 = 9$. Then $2(9) - 5 = 18 - 5 = 13$.
2. **C. $1\frac{5}{12}$** Use denominator 12: $9/12 + 8/12 = 17/12 = 1\frac{5}{12}$.
3. **B. \$36** Convert 15% to 0.15 and multiply: $0.15(240) = 36$.
4. **C. 40** The ratio has 8 equal parts. Each part is $64/8 = 8$ tickets; the larger group receives $5(8) = 40$.
5. **A. 1** An odd power keeps the negative sign: $(-2)^3 = -8$. Also, $3^2 = 9$, so the sum is 1.
6. **B. 17** The principal square roots are 12 and 5, and $12 + 5 = 17$.
7. **C. 6** Add 7 to both sides to get $4x = 24$, then divide by 4.
8. **B. $x \leq 2$** Divide by 3: $2x + 1 \leq 5$. Subtract 1 and divide by 2 to get $x \leq 2$.
9. **B. 7** Add the equations to eliminate y : $2x = 14$, so $x = 7$.
10. **B. 2** Slope is change in y divided by change in x : $(11 - 3)/(6 - 2) = 8/4 = 2$.
11. **C. 11** Substitute 5 for x : $3(5) - 4 = 15 - 4 = 11$.
12. **B. 8** Substitute 4: $f(4) = 4^2 - 2(4) = 16 - 8 = 8$.
13. **D. 25** First, $g(2) = 2(2) + 1 = 5$. Then $f(5) = 5^2 = 25$.
14. **A. 3** Factor the expression as $(x - 3)(x - 4) = 0$. The solutions are 3 and 4, so the smaller is 3.
15. **C. 3** The denominator cannot be zero, so $x \neq 1$. Multiply both sides by $x - 1$: $2 = x - 1$, giving $x = 3$.
16. **A. $-3x^2 + 3x$** Combine the x^2 terms, $3x^2 - 6x^2 = -3x^2$, and the x terms, $-2x + 5x = 3x$.
17. **C. 63** The first term is 7 and the common difference is 4. The 15th term is $7 + 14(4) = 63$.
18. **C. 16** Combine exponents: $2^{5+3-4} = 2^4 = 16$.
19. **C. 60°** Triangle angles sum to 180° . The third angle is $180 - 52 - 68 = 60^\circ$.
20. **B. 13** Use $a^2 + b^2 = c^2$: $5^2 + 12^2 = 25 + 144 = 169$, so $c = 13$.
21. **B. 12π** Circumference is $2\pi r$. With $r = 6$, it is 12π .
22. **C. 36π** The volume is $\pi r^2 h = \pi(3^2)(4) = 36\pi$.
23. **B. 5** The horizontal and vertical changes are 3 and 4. The distance is $\sqrt{3^2 + 4^2} = 5$.
24. **C. 17.5** The scale factor from smaller to larger is $10/4 = 2.5$. The matching side is $7(2.5) = 17.5$.
25. **B. 70** Since $2(l + w) = 34$, $l + w = 17$. With $l = 10$, the width is 7 and the area is $10(7) = 70$.

26. **A. $\frac{4}{5}$** Cosine is adjacent divided by hypotenuse, so $\cos \theta = 8/10 = 4/5$.
27. **B. $\frac{5}{13}$** Sine is opposite divided by hypotenuse, so $\sin \theta = 5/13$.
28. **A. $\frac{1}{6}$** There are 6 outcomes with sum 7 among 36 equally likely ordered outcomes, so the probability is $6/36 = 1/6$.
29. **C. 10** A mean of 8 for five values requires a total of 40. The known values total 30, so the missing value is 10.
30. **B. 7** The values are already in order. The middle of five values is the third value, 7.
31. **C. 8** The range is the greatest value minus the least: $11 - 3 = 8$.
32. **D. $\frac{2}{3}$** There are 12 tiles total and 8 are not red. The probability is $8/12 = 2/3$.
33. **C. 10** Each pair can be chosen in $\binom{5}{2} = 5(4)/2 = 10$ ways.
34. **C. 36** The original area is $8(5) = 40$. The removed square has area 4, leaving 36 square units.
35. **B. \$210** Five percent of 200 is 10. Add the increase to the starting balance: $200 + 10 = 210$.
36. **C. 10** The squared term is at least zero, so its negative is at most zero. The maximum occurs at $x = 3$ and equals 10.
37. **B. \$11.20** Each notebook costs $6.40/4 = 1.60$. Seven cost $7(1.60) = 11.20$.
38. **C. 10 km** The speed is $12/3 = 4$ kilometers per hour. In 2.5 hours the distance is $4(2.5) = 10$ km.
39. **B. 12** Three ratio parts equal 18, so each part is 6. The red count is two parts, or 12.
40. **A. $\frac{1}{10}$** The first blue draw has probability $2/5$. Then one blue remains among 4 counters, so the probability is $(2/5)(1/4) = 1/10$.
41. **D. \$96** Use $I = Prt$: $800(0.04)(3) = 96$.
42. **B. $x + 3$** Factor the numerator: $x^2 - 9 = (x - 3)(x + 3)$. Cancel $x - 3$; the restriction $x \neq 3$ remains.
43. **A. $x \geq 3$** The radicand must be nonnegative: $2x - 6 \geq 0$, so $x \geq 3$.
44. **C. 16** The equation means $2^4 = x$, so $x = 16$.
45. **C. 50** Direct proportion means $y = kx$. Here $k = 15/3 = 5$, so at $x = 10$, $y = 50$.