AMC 8-style original practice test - Edition 1

Hint sheet

Try independently first. Read hint 1 before hint 2.

1. A museum charges $7 for each adult ticket and $4 for each child ticket. What is the cost of 2 adult tickets and 3 child tickets?

A. $22 B. $24 C. $25 D. $26 E. $29

Hint 1: Find the adult-ticket cost and the child-ticket cost separately.

Hint 2: The two costs are 2 x $7 and 3 x $4.

2. A $50 backpack is discounted by 20%. A sales tax of 10% is then applied to the discounted price. What is the final price?

A. $35 B. $40 C. $44 D. $45 E. $55

Hint 1: Apply the discount before calculating the tax.

Hint 2: After the discount, the price is 80% of $50.

3. The three angles of a triangle are in the ratio 2:3:4. What is the smallest angle?

A. 20 degrees B. 30 degrees C. 40 degrees D. 45 degrees E. 60 degrees

Hint 1: The angles of a triangle add to 180 degrees.

Hint 2: There are 2 + 3 + 4 = 9 equal angle-parts.

4. A two-digit number is formed using two different digits from 3, 5, and 7. How many such numbers are divisible by 5?

A. 1 B. 2 C. 3 D. 4 E. 6

Hint 1: A number divisible by 5 must end in 0 or 5.

Hint 2: Here the units digit must be 5. List the possible tens digits.

5. A rectangle has perimeter 30 cm. Its length is twice its width. What is its area?

A. 25 square cm B. 40 square cm C. 45 square cm D. 50 square cm E. 100 square cm

Hint 1: Half the perimeter is the length plus the width.

Hint 2: If the width is w, then the length plus the width is 3w.

6. Five numbers have mean 12. One of the numbers, 8, is removed. What is the mean of the remaining four numbers?

A. 10 B. 11 C. 12 D. 13 E. 14

Hint 1: Recover the sum of the five numbers from their mean.

Hint 2: Subtract 8 from that sum, then divide by 4.

7. How many integers from 1 through 60, inclusive, are divisible by 4 or by 6?

A. 15 B. 18 C. 20 D. 25 E. 30

Hint 1: Count multiples of 4 and multiples of 6.

Hint 2: Multiples of 12 appear in both lists, so subtract their count once.

AMC 8-style original practice test - Edition 1

Hint sheet

Try independently first. Read hint 1 before hint 2.

8. A fair six-sided die is rolled twice. What is the probability that the sum of the two results is odd?

A. 1/6 B. 1/3 C. 1/2 D. 2/3 E. 5/6

Hint 1: An odd sum uses one odd result and one even result.

Hint 2: There are 3 odd and 3 even faces; count both possible orders.

9. A sequence starts at 3. To obtain the next terms, add 2, then 4, then 6, and continue adding consecutive positive even numbers. What is the eighth term?

A. 45 B. 51 C. 57 D. 59 E. 75

Hint 1: To reach the eighth term, make seven additions.

Hint 2: Pair terms in 2 + 4 + 6 + 8 + 10 + 12 + 14.

10. On a square grid, a robot travels from (0, 0) to (3, 2), using only steps one unit right or one unit up. How many routes avoid the point (1, 1)?

A. 3 B. 4 C. 5 D. 6 E. 10

Hint 1: Count all routes, then subtract the routes that visit (1, 1).

Hint 2: There are 2 routes to (1, 1) and 3 routes from there to (3, 2).

11. A team plays 12 games. It earns 3 points for a win, 1 point for a tie, and 0 points for a loss. It has 4 ties and 22 points. How many losses does it have?

A. 0 B. 1 C. 2 D. 4 E. 6

Hint 1: Remove the points earned in tied games.

Hint 2: The wins account for 22 - 4 = 18 points.

12. A rectangular floor is 84 cm by 60 cm. It is covered with identical square tiles of the largest possible whole-number side length, with no gaps or cutting. How many tiles are needed?

A. 12 B. 24 C. 30 D. 35 E. 42

Hint 1: The tile side length must divide both 84 and 60.

Hint 2: Their greatest common divisor is 12.

13. A tank is one-third full. Adding 12 liters makes it five-sixths full. What is the tank's capacity?

A. 18 liters B. 20 liters C. 24 liters D. 30 liters E. 36 liters

Hint 1: Find what fraction of the capacity was added.

Hint 2: The increase is 5/6 - 1/3 = 1/2 of the tank.

AMC 8-style original practice test - Edition 1

Hint sheet

Try independently first. Read hint 1 before hint 2.

14. All six faces of a cube are painted. The cube is then cut into 27 equal small cubes in a 3 by 3 by 3 arrangement. How many small cubes have exactly two painted faces?

A. 6 B. 8 C. 12 D. 18 E. 20

Hint 1: Small cubes with exactly two painted faces lie on edges but not at corners.

Hint 2: Each of the large cube's 12 edges has one noncorner small cube.

15. How many ordered pairs of positive integers (x, y) satisfy x + 2y = 15?

A. 5 B. 6 C. 7 D. 8 E. 14

Hint 1: Solve for x in terms of y and require x >= 1.

Hint 2: The possible values of y are the integers from 1 through 7.

16. Triangle ABC has area 72 square units. M is the midpoint of AB. N lies on AC with AN:NC = 1:2. What is the area of triangle AMN?

A. 8 B. 12 C. 18 D. 24 E. 36

Hint 1: Triangles with the same altitude have areas in the ratio of their bases.

Hint 2: First replace AB with AM, then replace AC with AN.

17. How many integers from 1 through 100 leave remainder 2 when divided by 5 and remainder 3 when divided by 7?

A. 1 B. 2 C. 3 D. 4 E. 5

Hint 1: List the numbers that are 3 more than a multiple of 7.

Hint 2: After finding the first common solution, add 35 to find the next.

18. A bag contains 3 red counters and 2 blue counters. Two counters are chosen uniformly without replacement. What is the probability that they have the same color?

A. 1/5 B. 3/10 C. 2/5 D. 1/2 E. 3/5

Hint 1: Count unordered pairs of counters.

Hint 2: There are 3 pairs of red counters and 1 pair of blue counters.

19. A three-digit palindrome has hundreds digit 2 and is divisible by 9. What is the number?

A. 222 B. 232 C. 242 D. 252 E. 272

Hint 1: A palindrome reads the same in either direction.

Hint 2: Write its digits as 2, b, 2 and use the divisibility-by-9 digit-sum test.

AMC 8-style original practice test - Edition 1

Hint sheet

Try independently first. Read hint 1 before hint 2.

20. Six chairs are in a row. In how many ways can two of the chairs be selected so that they are not adjacent? The two selected chairs are not assigned to particular people.

A. 8 B. 9 C. 10 D. 12 E. 15

Hint 1: Start with all selections of two chairs.

Hint 2: There are 5 adjacent pairs to exclude.

21. At 3:20 on a clock whose hands move continuously, what is the smaller angle between the hour hand and the minute hand?

A. 10 degrees B. 20 degrees C. 25 degrees D. 30 degrees E. 40 degrees

Hint 1: The hour hand has moved beyond 3 by 3:20.

Hint 2: The minute hand is 120 degrees clockwise from 12; the hour hand moves 0.5 degree each minute.

22. A 4 by 4 board consists of 16 unit squares. How many squares of all sizes have sides along the grid lines?

A. 16 B. 20 C. 25 D. 30 E. 40

Hint 1: Count separately by side length.

Hint 2: There are 16 of side 1, 9 of side 2, and so on.

23. Use the digits 1, 2, 3, and 4 exactly once to form two two-digit numbers. What is the smallest possible positive difference between the two numbers?

A. 3 B. 5 C. 7 D. 9 E. 11

Hint 1: Let the larger number have the larger tens digit.

Hint 2: With consecutive tens digits, the difference is 10 plus the difference of the units digits.

24. Positive integers a and b satisfy a + b = 12. Their product is not divisible by 3. What is the greatest possible product?

A. 27 B. 30 C. 32 D. 35 E. 36

Hint 1: For a fixed sum, products increase as the two numbers get closer together.

Hint 2: The closest pair is 6 and 6, but its product is divisible by 3. Try the next closest pair.

25. Two players alternate removing 1, 2, or 3 stones from a pile of 30 stones. The player who removes the last stone wins. Which first move guarantees the first player a win if they continue to play correctly?

A. Remove 1 stone B. Remove 2 stones C. Remove 3 stones D. Any legal first move E. No first move guarantees a win

Hint 1: Look at piles of 4 stones and then 8 stones.

Hint 2: Leave a multiple of 4, then make each pair of moves remove 4 stones.