
AMC 10

SET 8

HALF-LENGTH PRACTICE

TIME ALLOWED

30 : 00

10 QUESTIONS • 30 MINUTES • 60 POINTS • MIDDLE BAND (PROBLEMS 10--20)

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO BEGIN.

Name _____ Date _____ Start _____ Finish _____

All 10 problems come from positions 10–20 of past AMC 10 contests (2000–2019) and appear in their original wording, in order of their original position. Problems © Mathematical Association of America.

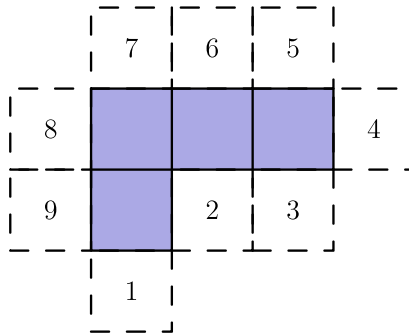
INSTRUCTIONS

1. Do not open this booklet until you are told to begin.
2. This is a 10-question multiple-choice test. Every problem was originally problem 10 to 20 of an AMC 10 — the middle band of the paper, where scores are decided. They appear in order of their original position, so the difficulty rises from the first problem to the last.
3. Each question is followed by answers marked (A), (B), (C), (D) and (E). Only one of these is correct. Mark your answers on the answer sheet at the back of this booklet.
4. **Scoring:** 6 points for each correct answer, 1.5 points for each problem left unanswered, 0 points for each incorrect answer. A random guess is worth less, on average, than a blank.
5. Only scratch paper, graph paper, rulers, compasses, protractors and erasers are allowed. No calculators, smartwatches, phones or computing devices.
6. Figures are not necessarily drawn to scale.
7. You will have **30 minutes**. Note your start time on the cover and stop the moment the time is up.

Pacing guide

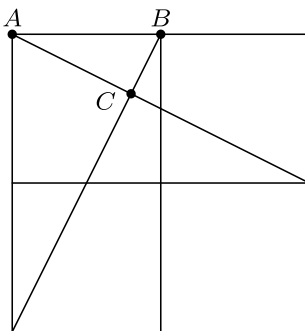
Three minutes per problem is the pace of the real test in this band: problems 1–5 in about 13 minutes, problems 6–10 in the remaining 17. If a problem has taken three minutes with no plan in sight, move on and come back.

1. The polygon enclosed by the solid lines in the figure consists of 4 congruent squares joined edge-to-edge. One more congruent square is attached to an edge at one of the nine positions indicated. How many of the nine resulting polygons can be folded to form a cube with one face missing?



- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6
2. Jamal wants to store 30 computer files on floppy disks, each of which has a capacity of 1.44 megabytes (mb). Three of his files require 0.8 mb of memory each, 12 more require 0.7 mb each, and the remaining 15 require 0.4 mb each. No file can be split between floppy disks. What is the minimal number of floppy disks that will hold all the files?
- (A) 12 (B) 13 (C) 14 (D) 15 (E) 16
3. What is the greatest possible sum of the digits in the base-seven representation of a positive integer less than 2019?
- (A) 11 (B) 14 (C) 22 (D) 23 (E) 27
4. It takes Clea 60 seconds to walk down an escalator when it is not operating, and only 24 seconds to walk down the escalator when it is operating. How many seconds does it take Clea to ride down the operating escalator when she just stands on it?
- (A) 36 (B) 40 (C) 42 (D) 48 (E) 52
5. How many three-digit numbers satisfy the property that the middle digit is the average of the first and the last digits?
- (A) 41 (B) 42 (C) 43 (D) 44 (E) 45

6. Three unit squares and two line segments connecting two pairs of vertices are shown. What is the area of $\triangle ABC$?



- (A) $\frac{1}{6}$ (B) $\frac{1}{5}$ (C) $\frac{2}{9}$ (D) $\frac{1}{3}$ (E) $\frac{\sqrt{2}}{4}$
7. Suppose that $4^a = 5$, $5^b = 6$, $6^c = 7$, and $7^d = 8$. What is $a \cdot b \cdot c \cdot d$?
- (A) 1 (B) $\frac{3}{2}$ (C) 2 (D) $\frac{5}{2}$ (E) 3
8. Rectangle $ABCD$ has $AB = 6$ and $BC = 3$. Point M is chosen on side AB so that $\angle AMD = \angle CMD$. What is the degree measure of $\angle AMD$?
- (A) 15 (B) 30 (C) 45 (D) 60 (E) 75
9. In 1991 the population of a town was a perfect square. Ten years later, after an increase of 150 people, the population was 9 more than a perfect square. Now, in 2011, with an increase of another 150 people, the population is once again a perfect square. Which of the following is closest to the percent growth of the town's population during this twenty-year period?
- (A) 42 (B) 47 (C) 52 (D) 57 (E) 62
10. A set of 25 square blocks is arranged into a 5×5 square. How many different combinations of 3 blocks can be selected from that set so that no two are in the same row or column?
- (A) 100 (B) 125 (C) 600 (D) 2300 (E) 3600

END OF EXAMINATION

ANSWER SHEET

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Name _____

Date _____

1 ☐A ☐B ☐C ☐D ☐E

2 ☐A ☐B ☐C ☐D ☐E

3 ☐A ☐B ☐C ☐D ☐E

4 ☐A ☐B ☐C ☐D ☐E

5 ☐A ☐B ☐C ☐D ☐E

6 ☐A ☐B ☐C ☐D ☐E

7 ☐A ☐B ☐C ☐D ☐E

8 ☐A ☐B ☐C ☐D ☐E

9 ☐A ☐B ☐C ☐D ☐E

10 ☐A ☐B ☐C ☐D ☐E

Fill in one circle per question. Leave the row empty to skip.

Correct	Blank	Wrong	Score
×6	×1.5	×0	/ 60