
AMC 10

SET 14

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.

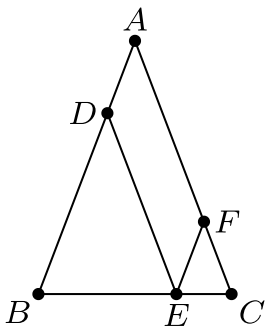
1. For how many real values of x is $\sqrt{120 - \sqrt{x}}$ an integer?

(A) 3 (B) 6 (C) 9 (D) 10 (E) 11

2. How many 7-digit palindromes (numbers that read the same backward as forward) can be formed using the digits 2, 2, 3, 3, 5, 5, 5?

(A) 6 (B) 12 (C) 24 (D) 36 (E) 48

3. In $\triangle ABC$, $AB = AC = 28$ and $BC = 20$. Points D , E , and F are on sides $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$, respectively, such that $\overline{DE}$ and $\overline{EF}$ are parallel to $\overline{AC}$ and $\overline{AB}$, respectively. What is the perimeter of parallelogram $ADEF$?



(A) 48 (B) 52 (C) 56 (D) 60 (E) 72

4. What is the sum of all real numbers x for which the median of the numbers 4, 6, 8, 17, and x is equal to the mean of those five numbers?

(A) -5 (B) 0 (C) 5 (D) $\frac{15}{4}$ (E) $\frac{35}{4}$

5. For a set of four distinct lines in a plane, there are exactly N distinct points that lie on two or more of the lines. What is the sum of all possible values of N ?

(A) 14 (B) 16 (C) 18 (D) 19 (E) 21

6. A street has parallel curbs 40 feet apart. A crosswalk bounded by two parallel stripes crosses the street at an angle. The length of the curb between the stripes is 15 feet and each stripe is 50 feet long. Find the distance, in feet, between the stripes.

(A) 9 (B) 10 (C) 12 (D) 15 (E) 25

7. If $a + 1 = b + 2 = c + 3 = d + 4 = a + b + c + d + 5$, then $a + b + c + d$ is

(A) -5 (B) $-\frac{10}{3}$ (C) $-\frac{7}{3}$ (D) $\frac{5}{3}$ (E) 5

8. What is the greatest power of 2 that is a factor of $10^{1002} - 4^{501}$?

(A) 2^{1002} (B) 2^{1003} (C) 2^{1004} (D) 2^{1005} (E) 2^{1006}

9. Suppose that $\{a_n\}$ is an arithmetic sequence with

$$a_1 + a_2 + \cdots + a_{100} = 100$$

and

$$a_{101} + a_{102} + \cdots + a_{200} = 200.$$

What is the value of $a_2 - a_1$?

(A) 0.0001 (B) 0.001 (C) 0.01 (D) 0.1 (E) 1

10. Bernardo and Silvia play the following game. An integer between 0 and 999 inclusive is selected and given to Bernardo. Whenever Bernardo receives a number, he doubles it and passes the result to Silvia. Whenever Silvia receives a number, she adds 50 to it and passes the result to Bernardo. The winner is the last person who produces a number less than 1000.

Let N be the smallest initial number that results in a win for Bernardo. What is the sum of the digits of N ?

(A) 7 (B) 8 (C) 9 (D) 10 (E) 11

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