
AMC 10

SET 1

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. Nebraska, the home of the AMC, changed its license plate scheme. Each old license plate consisted of a letter followed by four digits. Each new license plate consists of three letters followed by three digits. By how many times is the number of possible license plates increased?

(A) $\frac{26}{10}$ (B) $\frac{26^2}{10^2}$ (C) $\frac{26^2}{10}$ (D) $\frac{26^3}{10^3}$ (E) $\frac{26^3}{10^2}$

2. For how many integers x is the point $(x, -x)$ inside or on the circle of radius 10 centered at $(5, 5)$?

(A) 11 (B) 12 (C) 13 (D) 14 (E) 15

3. Five friends sat in a movie theater in a row containing 5 seats, numbered 1 to 5 from left to right. (The directions “left” and “right” are from the point of view of the people as they sit in the seats.)

During the movie Ada went to the lobby to get some popcorn. When she returned, she found that Bea had moved two seats to the right, Ceci had moved one seat to the left, and Dee and Edie had switched seats, leaving an end seat for Ada. In which seat had Ada been sitting before she got up?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

4. The average of the numbers $1, 2, 3, \dots, 98, 99$, and x is $100x$. What is x ?

(A) $\frac{49}{101}$ (B) $\frac{50}{101}$ (C) $\frac{1}{2}$ (D) $\frac{51}{101}$ (E) $\frac{50}{99}$

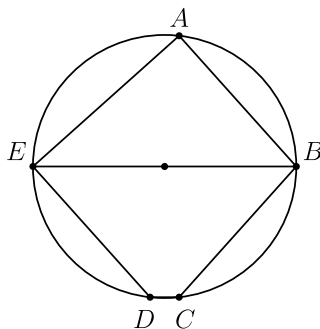
5. An envelope contains eight bills: 2 ones, 2 fives, 2 tens, and 2 twenties. Two bills are drawn at random without replacement. What is the probability that their sum is \$20 or more?

(A) $\frac{1}{4}$ (B) $\frac{2}{5}$ (C) $\frac{3}{7}$ (D) $\frac{1}{2}$ (E) $\frac{2}{3}$

6. For how many integers n is $\frac{n}{20-n}$ the square of an integer?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 10

7. In the given circle, the diameter $\overline{EB}$ is parallel to $\overline{DC}$, and $\overline{AB}$ is parallel to $\overline{ED}$. The angles $\angle AEB$ and $\angle ABE$ are in the ratio 4 : 5. What is the degree measure of angle $\angle BCD$?



- (A) 120 (B) 125 (C) 130 (D) 135 (E) 140
8. A sequence of three real numbers forms an arithmetic progression with a first term of 9. If 2 is added to the second term and 20 is added to the third term, the three resulting numbers form a geometric progression. What is the smallest possible value for the third term of the geometric progression?
- (A) 1 (B) 4 (C) 36 (D) 49 (E) 81
9. Rectangle $PQRS$ lies in a plane with $PQ = RS = 2$ and $QR = SP = 6$. The rectangle is rotated 90° clockwise about R , then rotated 90° clockwise about the point that S moved to after the first rotation. What is the length of the path traveled by point P ?
- (A) $(2\sqrt{3} + \sqrt{5})\pi$ (B) 6π (C) $(3 + \sqrt{10})\pi$
 (D) $(\sqrt{3} + 2\sqrt{5})\pi$ (E) $2\sqrt{10}\pi$
10. For how many integers x is the number $x^4 - 51x^2 + 50$ negative?
- (A) 8 (B) 10 (C) 12 (D) 14 (E) 16

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