
AMC 10

SET 18

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. A grocer makes a display of cans in which the top row has one can and each lower row has two more cans than the row above it. If the display contains 100 cans, how many rows does it contain?
- (A) 5 (B) 8 (C) 9 (D) 10 (E) 11
2. A student council must select a two-person welcoming committee and a three-person planning committee from among its members. There are exactly 10 ways to select a two-person team for the welcoming committee. It is possible for students to serve on both committees. In how many different ways can a three-person planning committee be selected?
- (A) 10 (B) 12 (C) 15 (D) 18 (E) 25
3. Suppose that n is the product of three consecutive integers and that n is divisible by 7. Which of the following is not necessarily a divisor of n ?
- (A) 6 (B) 14 (C) 21 (D) 28 (E) 42
4. Joe and JoAnn each bought 12 ounces of coffee in a 16-ounce cup. Joe drank 2 ounces of his coffee and then added 2 ounces of cream. JoAnn added 2 ounces of cream, stirred the coffee well, and then drank 2 ounces. What is the resulting ratio of the amount of cream in Joe's coffee to that in JoAnn's coffee?
- (A) $\frac{6}{7}$ (B) $\frac{13}{14}$ (C) 1 (D) $\frac{14}{13}$ (E) $\frac{7}{6}$
5. A triangle with side lengths in the ratio 3 : 4 : 5 is inscribed in a circle of radius 3. What is the area of the triangle?
- (A) 8.64 (B) 12 (C) 5π (D) 17.28 (E) 18
6. What is the units digit of 13^{2003} ?
- (A) 1 (B) 3 (C) 7 (D) 8 (E) 9

7. A line that passes through the origin intersects both the line $x = 1$ and the line

$$y = 1 + \frac{\sqrt{3}}{3}x.$$

The three lines create an equilateral triangle. What is the perimeter of the triangle?

- (A) $2\sqrt{6}$ (B) $2 + 2\sqrt{3}$ (C) 6 (D) $3 + 2\sqrt{3}$ (E) $6 + \frac{\sqrt{3}}{3}$

8. Three young brother-sister pairs from different families need to take a trip in a van. These six children will occupy the second and third rows in the van, each of which has three seats. To avoid disruptions, siblings may not sit right next to each other in the same row, and no child may sit directly in front of his or her sibling. How many seating arrangements are possible for this trip?

- (A) 60 (B) 72 (C) 92 (D) 96 (E) 120

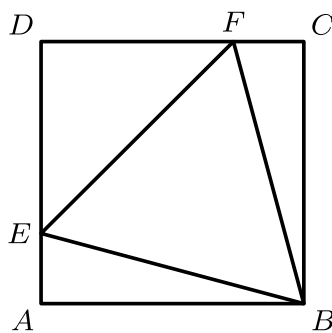
9. What is the least possible value of

$$(x + 1)(x + 2)(x + 3)(x + 4) + 2019,$$

where x is a real number?

- (A) 2017 (B) 2018 (C) 2019 (D) 2020 (E) 2021

10. Points E and F are located on square $ABCD$ so that $\triangle BEF$ is equilateral. What is the ratio of the area of $\triangle DEF$ to that of $\triangle ABE$?



- (A) $\frac{4}{3}$ (B) $\frac{3}{2}$ (C) $\sqrt{3}$ (D) 2 (E) $1 + \sqrt{3}$

END OF EXAMINATION

ANSWER SHEET

AMC 10 • HALF-LENGTH PRACTICE • SET 18

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