Practice quizes for the AMC 10/AMC 12

Topical Practice Quizes

We have designed 10 topical quizes (mini-contests) this year. Each cover a specific topic, these are:

There are 50 new problem worksheets, available in this 2007-2008 MathClub book, beginning on page 38. We have all the problems from previous Math Club publications included in the problems section on the MathClub web site. They are all indexed in Appendix IV. (NCTM) and V. (MW.com) in the back of this book. The web worksheets are currently in two variations, the worksheet format, (in both html and pdf format), and in a problem data base organized by the NCTM Standards.

In addition, we have the problems listed by subject matter in 2 listings:

NCTM Standards, with divisions:

- Algebra
- Connections
- Data Analysis & Probability
- Geometry
- Measurement
- Number & Operations
- Problem Solving

and MathWorld.com Classifications, with divisions:

- Algebra
- Applied Mathemetics
- Calculus & Analysis
- Discrete Mathematics
- Foundations of Mathematics
- Geometry
- History & Terminology
- Number Theory
- Probability & Statistics

Algebra

1. For the nonzero numbers a, b, and c, define

$$J(a,b,c) = \frac{a}{b} + \frac{b}{c} + \frac{c}{a}.$$

Find $J(2,12,9)$.

(A) 4 **(B)** 5 **(C)** 6 **(D)** 7 **(E)** 8

2. What is the value of

$$(3x-2)(4x+1) - (3x-2)4x + 1$$

when $x = 4$?

(A) 0 **(B)** 1 **(C)** 10 **(D)** 11 **(E)** 12

3. Let d and e denote the solutions of $2x^2 + 3x - 5 = 0$. What is the value of $(d-1)(e-1)$?

(A) $-\frac{5}{2}$ **(B)** 0 **(C)** 3 **(D)** 5 **(E)** 6

4. Suppose that a and b are nonzero real numbers, and that the equation $x^2 + ax + b = 0$ has solutions a and b. Then the pair (a, b) is

(A) $(-2,1)$ **(B)** $(-1,2)$ **(C)** $(1,-2)$ **(D)** $(2,-1)$ **(E)** $(4,4)$

5. Suppose A, B, and C are three numbers for which $1001C - 2002A = 4004$ and $1001B + 3003A = 5005$. The average of the three numbers A, B, and C is

(A) 1 **(B)** 3 **(C)** 6 **(D)** 9 **(E)** Not uniquely determined

6. Simplify

$$\sqrt[3]{x\sqrt[3]{x\sqrt[3]{x\sqrt{x}}}}.$$

(A) $\sqrt{x}$ **(B)** $\sqrt[3]{x^2}$ **(C)** $\sqrt[27]{x^2}$ **(D)** $\sqrt[54]{x}$ **(E)** $\sqrt[81]{x^{80}}$

7. Compute the sum of all the roots of $(2x+3)(x-4) + (2x+3)(x-6) = 0$.

(A) 7/2 **(B)** 4 **(C)** 5 **(D)** 7 **(E)** 13

8. The product of three consecutive positive integers is 8 times their sum. What is the sum of their squares?

(A) 50 **(B)** 77 **(C)** 110 **(D)** 149 **(E)** 194

Functions

1. For the nonzero numbers a, b, and c, define

$$\mathrm{D}(a,b,c) = \frac{abc}{a+b+c}.$$

Find $\mathrm{D}(2,4,6)$.

(A) 1 **(B)** 2 **(C)** 4 **(D)** 6 **(E)** 24

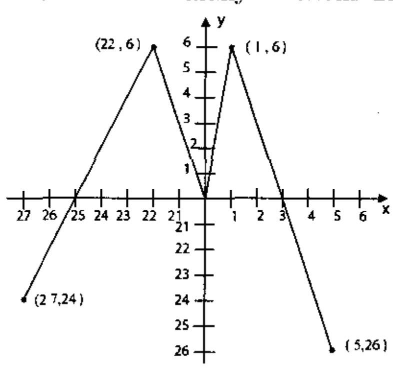
2. Define $x \heartsuit y$ to be $|x-y|$ for all real numbers x and y. Which of the following statements is **not** true?

(A) $x \heartsuit y = y \heartsuit x$ for all x and y **(B)** $2(x \heartsuit y) = (2x) \heartsuit (2y)$ for all x and y

(C) $x \heartsuit 0 = x$ for all x **(D)** $x \heartsuit x = 0$ for all x

(E) $x \heartsuit y > 0$ if $x \neq y$

3. The graph of the function f is shown below. How many solutions does the equation $f(f(x)) = 6$ have?



(A) 2 **(B)** 4 **(C)** 5 **(D)** 6 **(E)** 7

4. A parabola with equation $y = ax^2 + bx + c$ is reflected about the x-axis. The parabola and its reflection are translated horizontally five units in opposite directions to become the graphs of $y = f(x)$ and $y = g(x)$, respectively. Which of the following describes the graph of $y = (f+g)(x)$?

(A) a parabola tangent to the x-axis **(B)** a parabola not tangent to the x-axis

(C) a horizontal line **(D)** a non-horizontal line

(E) the graph of a cubic function

5. The graph of the polynomial

$$P(x) = x^5 + ax^4 + bx^3 + cx^2 + dx + e$$

has five distinct x-intercepts, one of which is at $(0,0)$. Which of the following coefficients cannot be zero?

(A) a **(B)** b **(C)** c **(D)** d **(E)** e

Geometry

1. A solid box is 15 cm by 10 cm by 8 cm. A new solid is formed by removing a cube 3 cm on a side from each corner of this box. What percent of the original volume is removed?

(A) 4.5 **(B)** 9 **(C)** 12 **(D)** 18 **(E)** 24

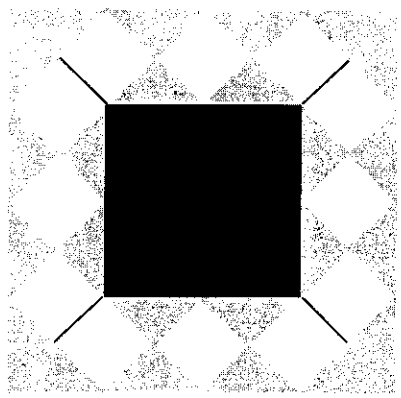
2. Find the degree measure of an angle whose complement is 25% of its supplement.

(A) 48 **(B)** 60 **(C)** 75 **(D)** 120 **(E)** 150

3. Let v, w, x, y, and z be the degree measures of the five angles of a pentagon. Suppose $v < w < x < y < z$ and v, w, x, y, and z form an arithmetic sequence. Find the value of x.

(A) 72 **(B)** 84 **(C)** 90 **(D)** 108 **(E)** 120

4. Betsy designed a flag using blue triangles ( ), small white squares (□), and a red center square(■), as shown. Let B be the total area of the blue triangles, W the total area of the white squares, and R the area of the red square. Which of the following is correct?

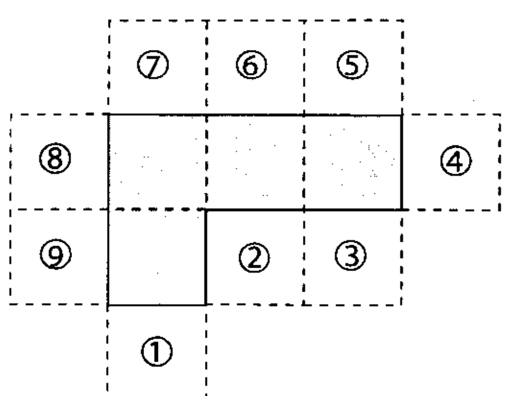


(A) $B = W$ **(B)** $W = R$ **(C)** $B = R$ **(D)** $3B = 2R$ **(E)** $2R = W$

5. A square and an equilateral triangle have the same perimeter. Let A be the area of the circle circumscribed about the square and B be the area of the circle circumscribed about the triangle. Find A/B.

(A) $\frac{9}{16}$ **(B)** $\frac{3}{4}$ **(C)** $\frac{27}{32}$ **(D)** $\frac{3\sqrt{6}}{8}$ **(E)** 1

6. 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?



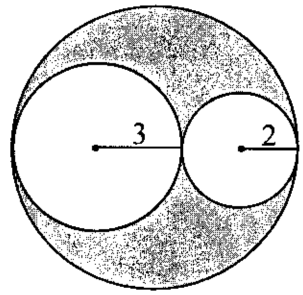
(A) 2 **(B)** 3 **(C)** 4 **(D)** 5 **(E)** 6

7. A regular octagon $ABCDEFGH$ has sides of length two. Find the area of $\triangle ADG$.

(A) $4 + 2\sqrt{2}$ **(B)** $6 + \sqrt{2}$ **(C)** $4 + 3\sqrt{2}$ **(D)** $3 + 4\sqrt{2}$ **(E)** $8 + \sqrt{2}$

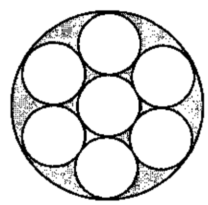
Geometry of Circles

1. Circles of radius 2 and 3 are externally tangent and are circumscribed by a third circle, as shown in the figure. Find the area of the shaded region.



(A) 3π **(B)** 4π **(C)** 6π **(D)** 9π **(E)** 12π

2. Each of the small circles in the figure has radius one. The innermost circle is tangent to the six circles that surround it, and each of those circles is tangent to the large circle and to its small-circle neighbors. Find the area of the shaded region.



(A) π **(B)** 1.5π **(C)** 2π **(D)** 3π **(E)** 3.5π

3. If an arc of $45°$ on circle A has the same length as an arc of $30°$ on circle B, then the ratio of the area of circle A to the area of circle B is

(A) $\frac{4}{9}$ **(B)** $\frac{2}{3}$ **(C)** $\frac{5}{6}$ **(D)** $\frac{3}{2}$ **(E)** $\frac{9}{4}$

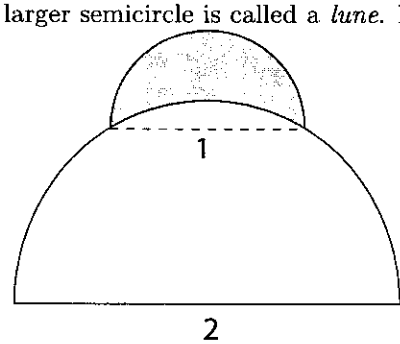
4. The number of inches in the perimeter of an equilateral triangle equals the number of square inches in the area of its circumscribed circle. What is the radius, in inches, of the circle?

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

5. Four distinct circles are drawn in a plane. What is the maximum number of points where at least two of the circles intersect?

(A) 8 **(B)** 9 **(C)** 10 **(D)** 12 **(E)** 16

6. A semicircle of diameter 1 sits at the top of a semicircle of diameter 2, as shown. The shaded area inside the smaller semicircle and outside the larger semicircle is called a *lune*. Determine the area of this lune.



(A) $\frac{1}{6}\pi - \frac{\sqrt{3}}{4}$ **(B)** $\frac{\sqrt{3}}{4} - \frac{1}{12}\pi$ **(C)** $\frac{\sqrt{3}}{4} - \frac{1}{24}\pi$ **(D)** $\frac{\sqrt{3}}{4} + \frac{1}{24}\pi$

(E) $\frac{\sqrt{3}}{4} + \frac{1}{12}\pi$

Geometry of Triangles

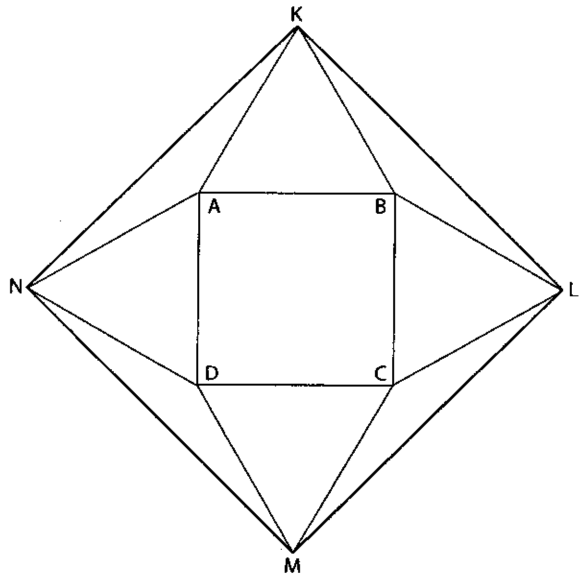
1. How many non-congruent triangles with perimeter 7 have integer side lengths?

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

2. The sides of a triangle have lengths of 15, 20, and 25. Find the length of the shortest altitude.

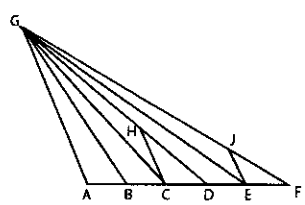
   (A) 6 **(B)** 12 **(C)** 12.5 **(D)** 13 **(E)** 15

3. Points K, L, M, and N lie in the plane of the square $ABCD$ so that AKB, BLC, CMD, and DNA are equilateral triangles. If $ABCD$ has an area of 16, find the area of $KLMN$.



   (A) 32 **(B)** $16+16\sqrt{3}$ **(C)** 48 **(D)** $32+16\sqrt{3}$ **(E)** 64

4. Points A, B, C, D, E, and F lie, in that order, on $\overline{AF}$, dividing it into five segments, each of length 1. Point G is not on line AF. Point H lies on $\overline{GD}$, and point J lies on $\overline{GF}$. The line segments $\overline{HC}$, $\overline{JE}$, and $\overline{AG}$ are parallel. Find HC/JE.

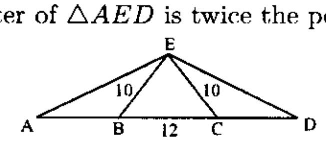


   (A) 5/4 **(B)** 4/3 **(C)** 3/2 **(D)** 5/3 **(E)** 2

5. Let $\triangle XOY$ be a right-angled triangle with $m\angle XOY = 90°$. Let M and N be the midpoints of legs OX and OY, respectively. Given that $XN = 19$ and $YM = 22$, find XY.

   (A) 24 **(B)** 26 **(C)** 28 **(D)** 30 **(E)** 32

6. Points A, B, C, and D lie on a line, in that order, with $AB = CD$ and $BC = 12$. Point E is not on the line, and $BE = CE = 10$. The perimeter of $\triangle AED$ is twice the perimeter of $\triangle BEC$. Find AB.



   (A) 15/2 **(B)** 8 **(C)** 17/2 **(D)** 9 **(E)** 19/2

Number Theory

1. What is the difference between the sum of the first 2003 even counting numbers and the sum of the first 2003 odd counting numbers?

   (A) 0 **(B)** 1 **(C)** 2 **(D)** 2003 **(E)** 4006

2. For how many positive integers n is $n^2 - 3n + 2$ a prime number?

   (A) none **(B)** one **(C)** two **(D)** more than two, but finitely many

   (E) infinitely many

3. Let n be a positive integer such that $\frac{1}{2} + \frac{1}{3} + \frac{1}{7} + \frac{1}{n}$ is an integer. Which of the following statements is **not** true:

   (A) 2 divides n **(B)** 3 divides n **(C)** 6 divides n **(D)** 7 divides n

   (E) $n > 84$

4. For how many positive integers m does there exist at least one positive integer n such that $m \cdot n \leq m + n$?

   (A) 4 **(B)** 6 **(C)** 9 **(D)** 12 **(E)** infinitely many

5. How many different integers can be expressed as the sum of three distinct members of the set $\{1, 4, 7, 10, 13, 16, 19\}$?

   (A) 13 **(B)** 16 **(C)** 24 **(D)** 30 **(E)** 35

6. The sum of the two 5-digit numbers $AMC10$ and $AMC12$ is 123422. What is $A + M + C$?

   (A) 10 **(B)** 11 **(C)** 12 **(D)** 13 **(E)** 14

7. 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

8. The number $25^{64} \cdot 64^{25}$ is the square of a positive integer N. In decimal representation, the sum of the digits of N is

   (A) 7 **(B)** 14 **(C)** 21 **(D)** 28 **(E)** 35

9. Let n be the largest integer that is the product of exactly 3 distinct prime numbers, d, e and $10d + e$, where d and e are single digits. What is the sum of the digits of n?

   (A) 12 **(B)** 15 **(C)** 18 **(D)** 21 **(E)** 24

Probability

1. What is the probability that a randomly drawn positive factor of 60 is less than 7?

   (A) $\frac{1}{10}$ (B) $\frac{1}{6}$ (C) $\frac{1}{4}$ (D) $\frac{1}{3}$ (E) $\frac{1}{2}$

2. Using the letters A, M, O, S, and U, we can form 120 five-letter "words". If these "words" are arranged in alphabetical order, then the "word" $USAMO$ occupies position

   (A) 112 (B) 113 (C) 114 (D) 115 (E) 116

3. A point (x, y) is randomly picked from inside the rectangle with vertices $(0,0)$, $(4,0)$, $(4,1)$, and $(0,1)$. What is the probability that $x < y$?

   (A) $\frac{1}{8}$ (B) $\frac{1}{4}$ (C) $\frac{3}{8}$ (D) $\frac{1}{2}$ (E) $\frac{3}{4}$

4. What is the probability that an integer in the set $\{1, 2, 3, \ldots, 100\}$ is divisible by 2 and not divisible by 3?

   (A) $\frac{1}{6}$ (B) $\frac{33}{100}$ (C) $\frac{17}{50}$ (D) $\frac{1}{2}$ (E) $\frac{18}{25}$

5. Juan rolls a fair regular octahedral die marked with the numbers 1 through 8. Then Amal rolls a fair six-sided die. What is the probability that the product of the two rolls is a multiple of 3?

   (A) $\frac{1}{12}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{7}{12}$ (E) $\frac{2}{3}$

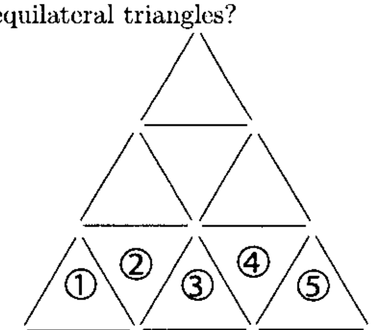
6. A point P is chosen at random in the interior of equilateral triangle ABC. What is the probability that $\triangle ABP$ has a greater area than each of $\triangle ACP$ and $\triangle BCP$?

   (A) $\frac{1}{6}$ (B) $\frac{1}{4}$ (C) $\frac{1}{3}$ (D) $\frac{1}{2}$ (E) $\frac{2}{3}$

7. Pat is to select six cookies from a tray containing only chocolate chip, oatmeal, and peanut butter cookies. There are at least six of each of these three kinds of cookies on the tray. How many different assortments of six cookies can be selected?

   (A) 22 (B) 25 (C) 27 (D) 28 (E) 729

8. A large equilateral triangle is constructed by using toothpicks to create rows of small equilateral triangles. For example, in the figure we have 3 rows of small congruent equilateral triangles, with 5 small triangles in the base row. How many toothpicks would be needed to construct a large equilateral triangle if the base row of the triangle consists of 2003 small equilateral triangles?



   (A) 1,004,004 (B) 1,005,006 (C) 1,507,509 (D) 3,015,018

   (E) 6,021,018

9. Tina randomly selects two distinct numbers from the set $\{1, 2, 3, 4, 5\}$, and Sergio randomly selects a number from the set $\{1, 2, \ldots, 10\}$. The probability that Sergio's number is larger than the sum of the two numbers chosen by Tina is

   (A) 2/5 (B) 9/20 (C) 1/2 (D) 11/20 (E) 24/25

Problem Solving

1. Members of the Rockham Soccer League buy socks and T–shirts. Socks cost \$4 per pair and each T–shirt costs \$5 more than a pair of socks. Each member needs one pair of socks and a shirt for home games and another pair of socks and a shirt for away games. If the total cost is \$2366, how many members are in the League?

   (A) 77 **(B)** 91 **(C)** 143 **(D)** 182 **(E)** 286

2. It takes Mary 30 minutes to walk uphill 1 km from her home to school, but it takes her only 10 minutes to walk from school to home along the same route. What is her average speed, in km/hr, for the round trip?

   (A) 3 **(B)** 3.125 **(C)** 3.5 **(D)** 4 **(E)** 4.5

3. Suppose July of year N has five Mondays. Which of the following must occur five times in August of year N? (Note: Both months have 31 days.)

   (A) Monday **(B)** Tuesday **(C)** Wednesday **(D)** Thursday **(E)** Friday

4. Al, Bert, and Carl are the winners of a school drawing for a pile of Halloween candy, which they are to divide in a ratio of $3:2:1$, respectively. Due to some confusion they come at different times to claim their prizes, and each assumes he is the first to arrive. If each takes what he believes to be his correct share of candy, what fraction of the candy goes unclaimed?

   (A) $\frac{1}{18}$ **(B)** $\frac{1}{6}$ **(C)** $\frac{2}{9}$ **(D)** $\frac{5}{18}$ **(E)** $\frac{5}{12}$

5. Mr. Earl E. Bird leaves his house for work at exactly 8:00 A.M. every morning. When he averages 40 miles per hour, he arrives at his workplace three minutes late. When he averages 60 miles per hour, he arrives three minutes early. At what average speed, in miles per hour, should Mr. Bird drive to arrive at his workplace precisely on time?

   (A) 45 **(B)** 48 **(C)** 50 **(D)** 55 **(E)** 58

6. Sarah pours four ounces of coffee into an eight-ounce cup and four ounces of cream into a second cup of the same size. She then transfers half the coffee from the first cup to the second and, after stirring thoroughly, transfers half the liquid in the second cup back to the first. What fraction of the liquid in the first cup is now cream?

   (A) 1/4 **(B)** 1/3 **(C)** 3/8 **(D)** 2/5 **(E)** 1/2

7. A $3\times 3\times 3$ cube is formed by gluing together 27 standard cubical dice. (On a standard die, the sum of the numbers on any pair of opposite faces is 7.) The smallest possible sum of all the numbers showing on the surface of the $3\times 3\times 3$ cube is

   (A) 60 **(B)** 72 **(C)** 84 **(D)** 90 **(E)** 96

8. Andy's lawn has twice as much area as Beth's lawn and three times as much area as Carlos' lawn. Carlos' lawn mower cuts half as fast as Beth's mower and one third as fast as Andy's mower. If they all start to mow their lawns at the same time, who will finish first?

   (A) Andy **(B)** Beth **(C)** Carlos **(D)** Andy and Carlos tie for first.

   (E) All three tie.

9. Riders on a Ferris wheel travel in a circle in a vertical plane. A particular wheel has radius 20 feet and revolves at the constant rate of one revolution per minute. How many seconds does it take a rider to travel from the bottom of the wheel to a point 10 vertical feet above the bottom?

   (A) 5 **(B)** 6 **(C)** 7.5 **(D)** 10 **(E)** 15

10. Sally has five red cards numbered 1 through 5 and four blue cards numbered 3 through 6. She stacks the cards so that the colors alternate and so that the number on each red card divides evenly into the number on each neighboring blue card. What is the sum of the numbers on the middle three cards?

    (A) 8 **(B)** 9 **(C)** 10 **(D)** 11 **(E)** 12

Sequences

1. If a, b, c, d are positive real numbers such that a, b, c, d form an increasing arithmetic sequence and a, b, d form a geometric sequence, then $\frac{a}{d}$ is

(A) $\frac{1}{12}$ **(B)** $\frac{1}{6}$ **(C)** $\frac{1}{4}$ **(D)** $\frac{1}{3}$ **(E)** $\frac{1}{2}$

2. The sum of 18 consecutive positive integers is a perfect square. The smallest possible value of this sum is

(A) 169 **(B)** 225 **(C)** 289 **(D)** 361 **(E)** 441

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

$$a_1 + a_2 + \cdots + a_{100} = 100 \quad \text{and} \quad a_{101} + a_{102} + \cdots + a_{200} = 200.$$

What is the value of $a_2 - a_1$?

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

4. Consider the sequence of numbers: 4, 7, 1, 8, 9, 7, 6, ... For $n > 2$, the nth term of the sequence is the units digit of the sum of the two previous terms. Let S_n denote the sum of the first n terms of this sequence. The smallest value of n for which $S_n > 10,000$ is:

(A) 1992 **(B)** 1999 **(C)** 2001 **(D)** 2002 **(E)** 2004

5. For all positive integers n less than 2002, let

$$a_n = \begin{cases} 11, & \text{if } n \text{ is divisible by 13 and 14;} \\ 13, & \text{if } n \text{ is divisible by 14 and 11;} \\ 14, & \text{if } n \text{ is divisible by 11 and 13;} \\ 0, & \text{otherwise.} \end{cases}$$

Calculate $\sum_{n=1}^{2001} a_n$.

(A) 448 **(B)** 486 **(C)** 1560 **(D)** 2001 **(E)** 2002

6. Let $\{a_k\}$ be a sequence of integers such that $a_1 = 1$ and $a_{m+n} = a_m + a_n + mn$, for all positive integers m and n. Then a_{12} is

(A) 45 **(B)** 56 **(C)** 67 **(D)** 78 **(E)** 89

7. Let $a_1, a_2, \ldots$ be a sequence for which

$$a_1 = 2, \quad a_2 = 3, \quad \text{and} \quad a_n = \frac{a_{n-1}}{a_{n-2}} \text{ for each positive integer } n \geq 3.$$

What is a_{2006}?

(A) $\frac{1}{2}$ **(B)** $\frac{2}{3}$ **(C)** $\frac{3}{2}$ **(D)** 2 **(E)** 3

8. Given a finite sequence $S = (a_1, a_2, \ldots, a_n)$ of n real numbers, let $A(S)$ be the sequence

$$\left(\frac{a_1 + a_2}{2}, \frac{a_2 + a_3}{2}, \ldots, \frac{a_{n-1} + a_n}{2}\right)$$

of $n - 1$ real numbers. Define $A^1(S) = A(S)$ and, for each integer m, $2 \leq m \leq n - 1$, define $A^m(S) = A(A^{m-1}(S))$. Suppose $x > 0$, and let $S = (1, x, x^2, \ldots, x^{100})$. If $A^{100}(S) = (1/2^{50})$, then what is x?

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

9. A sequence $a_1, a_2, \ldots$ of non-negative integers is defined by the rule $a_{n+2} = |a_{n+1} - a_n|$ for $n \geq 1$. If $a_1 = 999$, $a_2 < 999$, and $a_{2006} = 1$, how many different values of a_2 are possible?

(A) 165 **(B)** 324 **(C)** 495 **(D)** 499 **(E)** 660

Answers

Algebra, pp. 27-28

1.	(C)	2002 AMC 10A	Problem #2	E	86.08
2.	(D)	2002 AMC 10B	Problem #4	E	82.92
3.	(B)	2003 AMC 10A	Problem #5	M	45.74
4.	(C)	2002 AMC 10B	Problem #10	MH	33.34
5.	(B)	2002 AMC 10A	Problem #9	H	19.32
6.	(A)	2003 AMC 10A	Problem #9	MH	35.98
7.	(A)	2002 AMC 10A	Problem #10	MH	38.92
8.	(B)	2002 AMC 10B	Problem #11	M	50.73

Functions, pp. 29-30

1.	(C)	2002 AMC 10B	Problem #2	ME	78.45
2.	(C)	2003 AMC 10A	Problem #6	E	89.85
3.	(D)	2002 AMC 12A	Problem #19	H	11.83
4.	(D)	2003 AMC 12A	Problem #19	H	13.34
5.	(D)	2003 AMC 12A	Problem #21	H	8.53

Geometry, pp. 31-34

1.	(D)	2003 AMC 10A	Problem #3	H	19.76
2.	(B)	2002 AMC 12A	Problem #4	M	56.35
3.	(D)	2002 AMC 12B	Problem #5	ME	65.06
4.	(A)	2002 AMC 10A	Problem #8	ME	64.13
5.	(C)	2003 AMC 12A	Problem #11	MH	25.61
6.	(E)	2003 AMC 10A	Problem #10	H	19.65
7.	(C)	2002 AMC 10B	Problem #17	H	15.95

Geometry of Circles, pp. 35-38

1.	(E)	2002 AMC 10B	Problem #5	MH	37.44
2.	(C)	2002 AMC 10A	Problem #5	M	55.59
3.	(A)	2002 AMC 10A	Problem #7	MH	23.26
4.	(B)	2003 AMC 10A	Problem #17	MH	34.23
5.	(D)	2002 AMC 10B	Problem #18	H	16.01
6.	(C)	2003 AMC 10A	Problem #19	H	8.08
7.	(B)	2003 AMC 12A	Problem #17	H	10.37
8.	(C)	2002 AMC 12A	Problem #18	H	4.89

Geometry of Triangles, pp. 39-40

1.	(B)	2003 AMC 10A	Problem #7	H	7.58
2.	(B)	2002 AMC 10A	Problem #13	M	58.62
3.	(D)	2003 AMC 12A	Problem #14	MH	27.24
4.	(D)	2002 AMC 10A	Problem #20	H	4.70
5.	(B)	2002 AMC 10B	Problem #22	MH	23.08
6.	(D)	2002 AMC 10A	Problem #23	H	8.96

Number Theory, pp. 41-42

1.	(D)	2003 AMC 10A	Problem #1	H	19.86
2.	(B)	2002 AMC 10B	Problem #6	MH	38.48
3.	(E)	2002 AMC 10B	Problem #7	M	53.72
4.	(E)	2002 AMC 10A	Problem #4	M	46.64
5.	(A)	2002 AMC 12B	Problem #10	MH	35.53
6.	(E)	2003 AMC 10A	Problem #11	MH	29.74
7.	(B)	2002 AMC 10A	Problem #11	ME	65.76
8.	(B)	2002 AMC 10B	Problem #14	MH	30.31
9.	(A)	2003 AMC 10A	Problem #14	H	8.68

Probability, pp. 43-44

1.	(E)	2003 AMC 10A	Problem #8	ME	66.23
2.	(D)	2002 AMC 10B	Problem #9	MH	27.81
3.	(A)	2003 AMC 10A	Problem #12	H	9.98
4.	(C)	2003 AMC 10A	Problem #15	ME	63.47
5.	(C)	2002 AMC 12B	Problem #16	H	11.40
6.	(C)	2003 AMC 12A	Problem #16	H	18.19
7.	(D)	2003 AMC 10A	Problem #21	H	6.26
8.	(C)	2003 AMC 10A	Problem #23	H	12.46
9.	(A)	2002 AMC 10A	Problem #24	M	43.15

Problem Solving, p.45-46

1.	(B)	2003 AMC 10A	Problem #2	ME	77.53
2.	(A)	2003 AMC 10A	Problem #4	ME	65.43
3.	(D)	2002 AMC 10B	Problem #8	H	11.29
4.	(D)	2003 AMC 12A	Problem #10	M	54.70
5.	(B)	2002 AMC 10A	Problem #12	MH	26.54
6.	(D)	2002 AMC 10A	Problem #17	H	9.34
7.	(D)	2002 AMC 10A	Problem #18	H	6.95
8.	(B)	2002 AMC 10B	Problem #21	H	5.7
9.	(D)	2002 AMC 10B	Problem #24	H	.85
10.	(E)	2003 AMC 10A	Problem #24	H	.82

Sequences, p.47

1.	(C)	2002 AMC 12B	Problem #9	M	56.83
2.	(B)	2002 AMC 12B	Problem #13	MH	22.04
3.	(C)	2002 AMC 10B	Problem #19	H	4.72
4.	(B)	2002 AMC 12A	Problem #21	H	7.37
5.	(A)	2002 AMC 12B	Problem #21	H	14.76
6.	(D)	2002 AMC 10B	Problem #23	H	10.86
7.	(E)	2006 AMC 10B	Problem #18	H	10.34
8.	(B)	2006 AMC 12A	Problem #23	H	1.52
9.	(B)	2006 AMC 12B	Problem #25	H	2.19