1. Old MacDonald had a farm with only chickens and pigs. Chickens have two legs and pigs have four legs. One day Old MacDonald decided to count his animals. He counted 20 animals and 56 legs. How many chickens does he have?

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

2. Define $a \otimes b = a/b + b/a$. Find $(2009 \otimes 2010) \otimes (2010 \otimes 2009)$.

   (A) $\frac{2009}{2010}$ **(B)** $\frac{2010}{2009}$ **(C)** $\frac{4018}{2010}$ **(D)** 2 **(E)** $\frac{4020}{2009}$

3. Bob is a real estate agent. He can choose between two plans: Plan A gives him a base salary of \$30,000 and a 5% commission on what he sells. Plan B gives him a base salary of \$45,000 and a 2% commission on what he sells. How much should he sell so that he earns the same in each plan?

   (A) \$100,000 **(B)** \$200,000 **(C)** \$300,000 **(D)** \$400,000 **(E)** \$500,000

4. Evaluate: $\frac{7}{6} \cdot \frac{8}{7} \cdot \frac{9}{8} \cdots \frac{2010}{2009}$.

   (A) 7 **(B)** 41 **(C)** 287 **(D)** 335 **(E)** 2004

5. How many of the following letters have a line of symmetry as printed?

   `Q W E R T Y U I O P`

   (A) 5 **(B)** 6 **(C)** 7 **(D)** 8 **(E)** 9

6. A positive real number x has the property that it is 2 more than its multiplicative inverse. Which of the following is true?

   (A) $.5 < x < 1$ **(B)** $1 < x < 1.5$ **(C)** $1.5 < x < 2$ **(D)** $2 < x < 2.5$
   (E) $2.5 < x < 3$

7. A jar has blue, red, and yellow marbles. Yellow marbles make up 20% of the marbles in this jar. Once 5 blue marbles are added to the jar, blue marbles make up 64% of the marbles. Another 5 blue marbles are added, and now blue marbles make up 70% of the marbles in the jar. How many red marbles are in the jar?

   (A) 5 **(B)** 10 **(C)** 15 **(D)** 20 **(E)** 25

8. Let $P(n)$ be the product of the digits of n. How many positive integers n have the property $P(n) = n$?

   (A) 0 **(B)** 3 **(C)** 6 **(D)** 9 **(E)** Infinitely many

9. The areas of the six faces of a rectangular prism are 77, 77, 91, 91, 143, and 143. Find the volume of this prism.

   (A) 143 **(B)** 911 **(C)** 1001 **(D)** 1331 **(E)** 2002

10. The Mock AMC committee wants to issue commemorative lisence plates, consisting of a permutation of the letters $MOCKAMC$. For aesthetic reasons, the two M's cannot be together and the two C's must be next to each other. How many different lisence plates can be made under the given constraints?

    (A) 120 **(B)** 240 **(C)** 360 **(D)** 1260 **(E)** 5040

11. In triangle ΔABC, the median from A to BC is half the length of BC. Given that $AB = 20$ and $AC = 21$, find the area of this triangle.

    (A) 126 **(B)** 140 **(C)** $140\sqrt{2}$ **(D)** $140\sqrt{3}$ **(E)** 210

12. Two days ago, Mr. Wilson got stuck in traffic on the way to work, so he drove at an average speed of 30 mph and arrived at work 10 minutes late. Yesterday he left at the same time as two days ago but drove at a constant average speed of 60 mph. Unfortunately he was tagged for speeding and had to wait for 20 min, and ended up arriving to work 10 minutes late again. Today he woke up late and left the house 10 minutes later than usual, and arrived at work 10 minutes late yet again. If Mr. Wilson takes the same route to work each day, what was his average speed today?

    (A) 36 mph **(B)** 40 mph **(C)** 42 mph **(D)** 45 mph **(E)** 48 mph

13. Suppose n is the product of 5 consecutive integers greater than 2010. Which of the following numbers does not necessarily divide n?

    (A) 6 **(B)** 12 **(C)** 18 **(D)** 24 **(E)** 30

14. Ann randomly chooses a number in the set $\{1, 2, 3, 4, 5, 6, 7\}$ and Bob randomly chooses two different numbers in $\{1, 2, 3, 4\}$. What is the probability that the sum of Bob's numbers is greater than Ann's number?

    (A) $\frac{5}{14}$ **(B)** $\frac{3}{7}$ **(C)** $\frac{1}{2}$ **(D)** $\frac{4}{7}$ **(E)** $\frac{9}{14}$

15. Suppose x, y are positive real numbers such that $x + y \le 3$. What is the probability that $x + 2y$ and $2x + y$ are both less than 3?

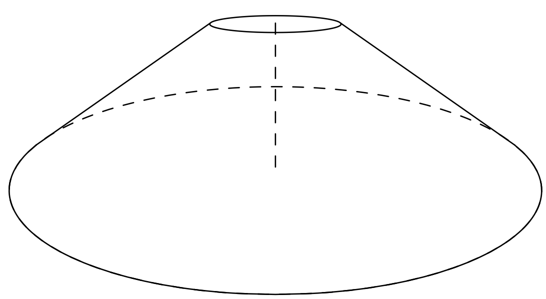
(A) $\frac{1}{6}$ **(B)** $\frac{1}{3}$ **(C)** $\frac{1}{2}$ **(D)** $\frac{2}{3}$ **(E)** $\frac{5}{6}$

16. In quadrilateral $ABCD$, the area of ΔABC is the same as the area of ΔDAB. Given that $AB = 12, BC = 4, CD = 7, CD = 5$, find the ratio of the area of ΔBCD to the area of ΔCDA.

(A) $\frac{7}{12}$ **(B)** $\frac{4}{5}$ **(C)** 1 **(D)** $\frac{5}{4}$ **(E)** $\frac{7}{12}$

17. You are given a cone. Using a plane parallel to the cone's base, you cut the cone into two pieces: a cone and a *frustum*. Given that this frustum has height 5 and the area of its bases are 6π and 96π, find its volume.

(A) 42π **(B)** 126π **(C)** 210π **(D)** 510π **(E)** 630π



18. Roger Federer and Rafael Nadal play in an exhibition series. The first match will be played on a grass court. After that, if Roger wins the previous game, then the next match is played on grass; otherwise the next match is played on clay. The first person to win two matches wins the series, and there are no ties. Given that Roger Federer wins on clay 25% of the time and wins on grass 50% percent of the time, what is the probablilty that Rafael Nadal wins the series?

(A) $\frac{1}{2}$ **(B)** $\frac{9}{16}$ **(C)** $\frac{5}{8}$ **(D)** $\frac{11}{16}$ **(E)** $\frac{3}{4}$

19. Each of four faces of a regular tetrahedron is colored one of 10 colors. How many distinct ways are there to color the tetrahedron? (Two colorings are considered distinct if they cannot be rotated to look like each other.)

(A) 925 **(B)** 980 **(C)** 1024 **(D)** 1090 **(E)** 1450

20. At each vertice of a cube, a tetrahedron is cut off, resulting in a solid with 6 regular octagons and 8 equilateral triangles as its faces. What fraction of the cube was cut off?

(A) $\frac{1}{48}$ **(B)** $\frac{10-7\sqrt{2}}{3}$ **(C)** $\frac{3-2\sqrt{2}}{3}$ **(D)** $10-7\sqrt{2}$ **(E)** $3-2\sqrt{2}$

21. The Rectangle Marching band has between 130 and 200 members. Originally the band members can be put into an array of m rows and n columns with no members left over. However, 17 more people join the band, so now they can march in $m+2$ rows and $n-1$ columns with no members left over. How many people were originally in the Rectangle Marching Band?

(A) 148 **(B)** 154 **(C)** 165 **(D)** 171 **(E)** 182

22. $ABCD$ is a rhombus with side length 1 such that $\angle ABC = 60^o$. What is the area of the largest semicircle that can fit inside this rhombus?

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

23. In the town of Cartesia, the Slanted River runs along the line $y = x$ and the Horizontal River runs along the x-axis. Renee's home is located at the point (7,1). Renee starts from his house, runs to the Slanted River, then runs to the Horizontal River, and then runs back to his house. What is the least distance he could have run?

(A) 10 **(B)** $6\sqrt{3}$ **(C)** $3\sqrt{2}+\sqrt{34}$ **(D)** $\frac{71}{7}$ **(E)** $1+\sqrt{85}$

24. A 2010×2010 rectangular table is tiled completely with 4040100 1×1 tiles. A circular coin with with diameter 2 is randomly tossed onto the table. Given that the coin lands completely on the table, what is the probability that it completely covers a tile?

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

25. Pete the mailman is delivering mail to the ten houses on the right side of Elm Street. He notices the following things: No two adjacent houses both get mail, and at most three houses in a row don't get any mail. How many ways are there for this to occur?

(A) 28 **(B)** 55 **(C)** 79 **(D)** 89 **(E)** 144