1. How much is 12 + 23 + 34 + 45 + 56 + 67 + 78 + 89 ?

   A) 389 B) 396 C) 404 D) 405 E) None of these

2. The closest integer to $\frac{2011}{2+0+1+1}$ is

   A) 500 B) 501 C) 502 D) 503 E) 504

3. What is the remainder when dividing the sum 2001 + 2002 + 2003 + … + 2011 by 2011?

   A) 0 B) 55 C) 1956 D) 2011 E) 66

4. Esther draws the six vertices of a regular hexagon and then connects some of the points with lines to obtain a geometric figure. Which of the following shapes can she NOT draw

   A) right triangle B) kite C) obtuse triangle D) square E) trapezoid

5. The product of four distinct natural numbers is 100. What is their sum?

   A) 14 B) 18 C) 20 D) 29 E) 103

6. In a class there are 9 boys and 13 girls. Half of the children in the class have got a cold. How many girls at least have a cold?

   A) 0 B) 1 C) 2 D) 3 E) 4

7. 60 Math Team members can eat 6 boxes of Welch's Fruit Snacks in 6 minutes. How many math team members will it take to eat 100 boxes of Welch's Fruit Snacks in 100 minutes?

   A) 100 B) 60 C) 6 D) 10 E) 600

8. Two sides of a triangle are 120 and 130 inches long. Which of the following numbers below could not be the length of the third side of the triangle?

   A) 40 B) 99 C) 100 D) 150 E) 260

9. In triangle ABC, angle C is three times bigger than angle A, and angle B is two times bigger than angle A. Then we can say that triangle ABC is

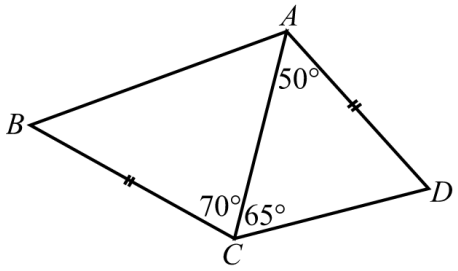
   A) Equilateral B) Isosceles C) Obtuse D) Right E) Acute

10. Nina has $147 and Rebecca has $57. How much money does Nina need to give Rebecca so that she would have twice as much money left as Rebecca has then?

    A) $11 B) $19 C) $30 D) $45 E) $49

11. Points A, B, C and D are marked on the straight line in some order. It is known that AB = 13, BC = 11, CD = 14 and DA = 12. What is the distance between the farthest two points?

    A) 14 B) 38 C) 50 D) 25 E) None of these

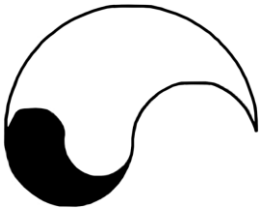


12. In the figure at left, in quadrilateral ABCD, we have AD = BC, ∠DAC = 50°, ∠DCA = 65°, ∠ACB = 70°. Find the value of ∠ABC.

A) 50° B) 55° C) 60° D) 65°
E) impossible to determine

13. A boy always speaks the truth on Thursday and Fridays, always tells lies on Tuesdays, and randomly tells the truth or lies on other days of the week. On seven consecutive days he was asked what his name was, and on the first six days he gave the following answers in order: Kelvin, Alex, Kelvin, Alex, Tony, Alex. What did he answer on the seventh day?

A) Kelvin B) Alex C) Tony D) Ryan E) impossible to determine

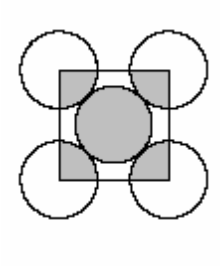


14. The logo shown at left, is made entirely from semicircular arcs of radius 2 cm, 4 cm or 8 cm. What fraction of the logo is shaded?

A) 1/3 B) 1/4 C) 1/5 D) 1/6 E) 1/7

15. What percent of all natural numbers from 1 to 10000 are perfect squares?

A) 1% B) 1.5% C) 2% D) 2.5% E) 5%



16. In the diagram, the five circles have the same radii, and they touch as shown. The small square joins the centers of the four outer circles. The ratio of the shaded area of all the circles to the non-shaded area of all the circles is:

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

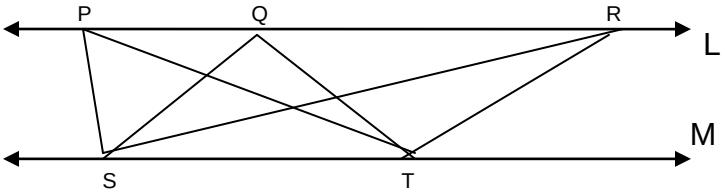
17. The people of planet Zork call themselves Zugwugs and they have arithmetic very similar to ours. They have parenthesis, addition, subtraction, multiplication and division. However, their order of operations are different. On Zork, parenthesis are evaluated first, followed by addition and subtraction, then multiplication and then finally division, and from right to left. They remember this with the mnemonic “PASMDE,” which in Zugwug language is an acronym for Puk Ark Sok Mog Dig Eeg and translates as “Please excuse my dear aunt Sally.” Evaluate the following expression using Zork arithmetic.

(13 + 16 ÷ 2 – 1) – (5 + 7 × 3 – 20)

A) 14 B) 233 C) 224 D) 135 E) 23

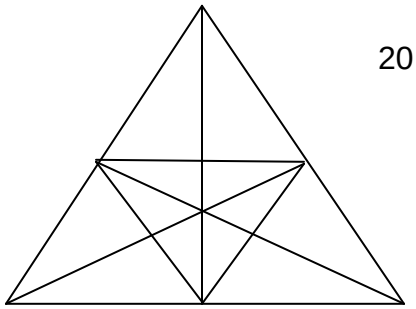
18. Which of the following fractions has the largest value?

A) 7/8 B) 66/77 C) 555/666 D) 4444/5555 E) 33333/44444



19. In the above figure, lines L and M are parallel. Points S and T are on line M and points P, Q and R are on line L. Three triangles are drawn, ΔPST, Δ QST, and Δ RST. Let the area of ΔPST be equal to a, the area of ΔQST be equal to b, and the area of Δ RST be equal to c. Which of the following inequalities is true?

A) a > b > c B) a > c > b C) c > a > b D) c > b > a E) None of these



20. How many triangles are in the figure?

A) 24 B) 25 C) 47 D) 48 E) 72

21. Two fractions are equally spaced between 1/4 and 2/3. The smaller of the two fractions is

A) 13/24 B) 7/18 C) 29/36 D) 5/12 E) 1/3

22. While playing around a creek, two boys. Wen and Arthur find an ordinary six-sided die buried in the dirt. Wen washes it off in the water and challenges Arthur to a contest. Each of the boys rolls the die exactly once. Wen's roll is 2 higher than Arthur's. "Let's play once more," says Arthur. Let a/b be the probability that the difference between the outcomes of the two dice rolls is again exactly 2 (regardless of which roll is higher), where a and b are relatively prime positive integers. Find a + b.

A) 23 B) 7 C) 5 D) 11 E) 19

23. Nikhil writes down 11 1's in a row and randomly writes + or − between each pair of consecutive 1's. For example, 1 + 1 + 1 − 1 − 1 + 1 − 1 + 1 − 1 – 1 - 1

What is the probability that the value of the expression Nikhil wrote down is 5?

A) 1/8 B) 3/16 C) 15/128 D) 17/128 E) 45/512

24. Hannah wants to complete the missing digits of the number 2 _ _ 8 with two different digits so that the resulting number is divisible by 9. In how many different ways could this be accomplished?

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

25. Consider a cube with side length 4. Through one face I drill a circular hole of radius 1 all the way through to the opposite side, with the center of the circle also the center of the square side of the cube. Through another side I drill a square hole of side 2 all the way through to the opposite side, with the center of the square hole also the center of the square side of the cube, and the sides of the square are parallel to the sides of the cube. I then drill a third hole, shaped like an equilateral triangle with side $\sqrt{3}$ all the way through to the opposite side, with the center of the triangular hole also the center of the square of the cube. What is the surface area of the new solid I have created by drilling the holes (include the surface area from drilling the holes.)

A) $120 + \pi + 9\sqrt{3}$ B) $120 + 3\sqrt{3}$ C) $120 + 2\pi + 9\sqrt{3}$

D) $120 + \frac{9\sqrt{3}}{2}$ E) $120 + 2\pi + \frac{9\sqrt{3}}{2}$