Think Academy

Summer AMC 8- Workshop 5

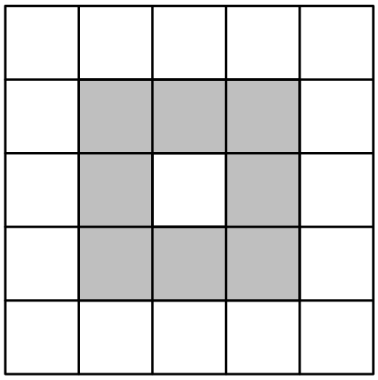
This material is designed for use in the classroom to simulate a Mock Exam.

To ensure accurate evaluation results, please DO NOT allow children to preview or complete the corresponding exercises in advance.

We will upload the classnotes (as the answers and solutions) after the class (exam).

Self-Round

1 Extend the square pattern of 8 black and 17 white square tiles by attaching a border of black tiles around the square. What is the ratio of black tiles to white tiles in the extended pattern? ( ) .



A. $8:17$ B. $25:49$ C. $36:25$ D. $32:17$ E. $36:17$

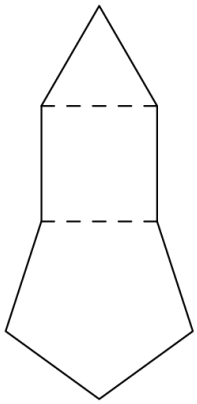
2 In the country of East Westmore, statisticians estimate there is a baby born every 8 hours and a death every day. To the nearest hundred, how many people are added to the population of East Westmore each year? ( ) .

A. 600 B. 700 C. 800 D. 900 E. 1000

3 What is the product of $\frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \cdots \times \frac{2006}{2005}$ ( ) .

A. 1 B. 1002 C. 1003 D. 2005 E. 2006

4 Construct a square on one side of an equilateral triangle. On one non-adjacent side of the square, construct a regular pentagon, as shown. On a non-adjacent side of the pentagon, construct a hexagon. Continue to construct regular polygons in the same way, until you construct an octagon. How many sides does the resulting polygon have? ( ) .

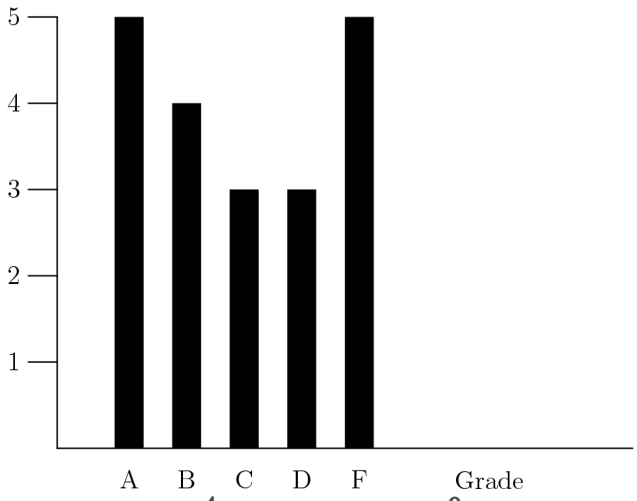


A. 21 B. 23 C. 25 D. 27 E. 29

5 A sequence of numbers starts with 1, 2, and 3. The fourth number of the sequence is the sum of the previous three numbers in the sequence: $1+2+3=6$. In the same way, every number after the fourth is the sum of the previous three numbers. What is the eighth number in the sequence? ( ) .

A. 11 B. 20 C. 37 D. 68 E. 99

6 The bar graph shows the grades in a mathematics class for the last grading period. If A, B, C, and D are satisfactory grades, what fraction of the grades shown in the graph are satisfactory? ( ) .



A. $\frac{1}{2}$ B. $\frac{2}{3}$ C. $\frac{3}{4}$ D. $\frac{4}{5}$ E. $\frac{9}{10}$

7 To complete the grid below, each of the digits 1 through 4 must occur once in each row and once in each column. What number will occupy the lower right-hand square? ( ) .

1		2	
2	3		
			4

A. 1 B. 2 C. 3 D. 4

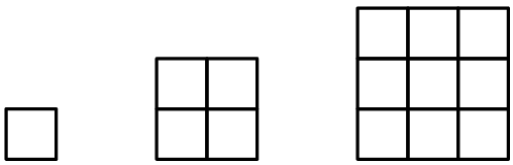
E. **cannot be determined**

8 Suppose m and n are positive odd integers. Which of the following must also be an odd integer? ( ) .

A. $m+3m$ B. $3m-n$ C. $3m^2+3n^2$ D. $(nm+3)^2$ E. $3mn$

In-Class

9 A sequence of squares is made of identical square tiles. The edge of each square is one tile length longer than the edge of the previous square. The first three squares are shown. How many more tiles does the seventh square require than the sixth? ( ) .



A. 11 B. 12 C. 13 D. 14 E. 15

10 How many different isosceles triangles have integer side lengths and perimeter 23? ( ) .

A. 2 B. 4 C. 6 D. 9 E. 11

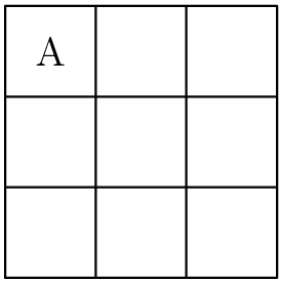
11 The sales tax rate in Bergville is 6%. During a sale at the Bergville Coat Closet, the price of a coat is discounted 20% from its $90.00 price. Two clerks, Jack and Jill, calculate the bill independently. Jack rings up $90.00 and adds 6% sales tax, then subtracts 20% from this total. Jill rings up $90.00, subtracts 20% of the price, then adds 6% of the discounted price for sales tax. What is Jack's total minus Jill's total? ( ) .

A. −$1.06 B. −$0.53 C. 0 D. $0.53 E. $1.06

12 The base of isosceles $\triangle ABC$ is 24 and its area is 60. What is the length of one of the congruent sides? ( ) .

A. 5 B. 8 C. 13 D. 14 E. 18

13 Three **A**'s, three **B**'s, and three **C**'s are placed in the nine spaces so that each row and column contain one of each letter. If **A** is placed in the upper left corner, how many arrangements are possible? ( ) .

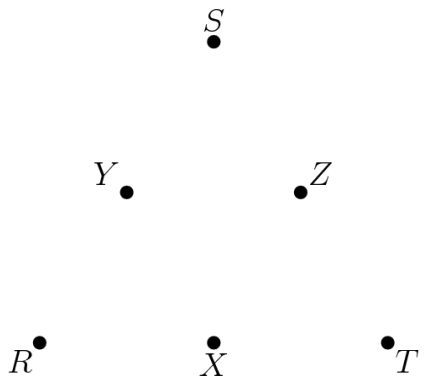


A. 2 B. 3 C. 4 D. 5 E. 6

14 What is the correct ordering of the three numbers, 10^8, 5^{12}, and 2^{24}? ( ) .

A. $2^{24} < 5^{12} < 10^8$ B. $2^{24} < 10^8 < 5^{12}$ C. $5^{12} < 10^8 < 2^{24}$ D. $10^8 < 2^{24} < 5^{12}$ E. $10^8 < 5^{12} < 2^{24}$

15 Points R, S and T are vertices of an equilateral triangle, and points X, Y and Z are midpoints of its sides. How many noncongruent triangles can be drawn usin g any three of these six points as vertices? ( ) .



A. 1 B. 2 C. 3 D. 4 E. 20

16 A box contains gold coins. If the coins are equally divided among six people, four coins are left over. If the coins are equally divided among five people, three coins are left over. If the box holds the smallest number of coins that meets these two conditions, how many coins are left when equally divided among seven people? ( ) .

A. 0 B. 1 C. 2 D. 3 E. 5

17 A lemming sits at a corner of a square with side length 10 meters. The lemming runs 6.2 meters along a diagonal toward the opposite corner. It stops, makes a 90 degree right turn and runs 2 more meters. A scientist measures the shortest distance between the lemming and each side of the square. What is the average of these four distances in meters? ( ) .

A. 2 B. 4.5 C. 5 D. 6.2 E. 7

18 The digits 1, 2, 3, 4, and 5 are each used once to write a five-digit number $PQRST$. The three-digit number PQR is divisible by 4, the three-digit number QRS is divisible by 5, and the three-digit number RST is divisible by 3. What is P? ( ) .

A. 1 B. 2 C. 3 D. 4 E. 5