

# MATHCOMP 2008

Grade 4 - 60 minutes






1. What is the value of  $8002 - 2008$ ?

- A) 5894                      B) 5994                      C) 6004                      D) 6094                      E) 6994

2. 142 minutes after 11:00 am is how many minutes before 2:00 pm?

- A) 18                      B) 22                      C) 32                      D) 38                      E) 78

3. The letter A is rotated  $180^\circ$  about O. What will be the position of A now?

- A)                       B)                       C)                       D)                       E) 

4. A factory makes dresses and shirts. Three dresses are made for every four shirts. If the factory produced 420 dresses and shirts today, how many dresses did it make?

- A) 140                      B) 180                      C) 210                      D) 240                      E) 315

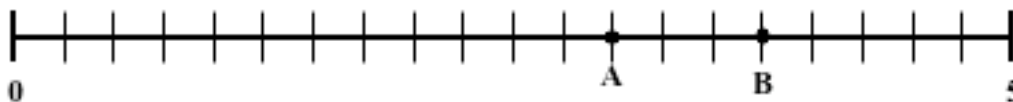
5. In how many ways can a square be cut in half with one straight cut?

- A) 1                      B) 2                      C) 4                      D) 8                      E) infinitely many

6. How many letters of the word **MATHCOMP** do not have any lines of symmetry?

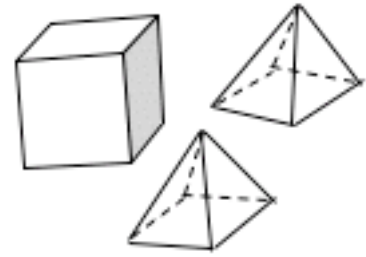
- A) 0                      B) 1                      C) 2                      D) 3                      E) 4

7. A number line from 0 to 5 is divided into 20 equal parts. What is the sum of the numbers located at points A and B?



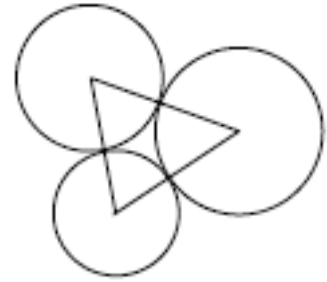
- A) 6                      B) 6.25                      C) 6.5                      D) 6.75                      E) 7

8. You are given a cube, 10 cm on a side, and two identical pyramids with square bases, 10-cm on a side. You glue the two pyramids to opposite faces of the cube so that the 10 cm squares line up. How many edges does the solid have?



- A) 8      B) 12      C) 16      D) 20      E) 24

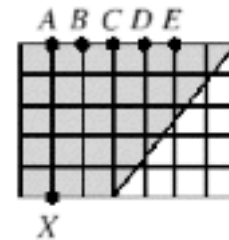
9. Three circles with radii 7cm, 8 cm, 9 cm touch each other externally without overlapping. What is the perimeter, in cm, of the triangle formed by joining the centers of the circles?



- A) 12      B) 24      C) 30      D)  $24\pi$       E) 48

10. Which of the following straight lines cuts the shaded area in half?

- A) XA      B) XB      C) XC      D) XD      E) XE



11. The odd integers between 8 to 2008 are multiplied together. The last digit [units digit] of the product is

- A) 1      B) 3      C) 5      D) 7      E) 9

12. In this additive magic square, five more numbers can be placed in the boxes so that the sum of the three numbers in each row, in each column, and in each diagonal is always the same. What is the number in A?

15		35
50		
25	A	

- A) 10      B) 20      C) 30      D) 40      E) 45

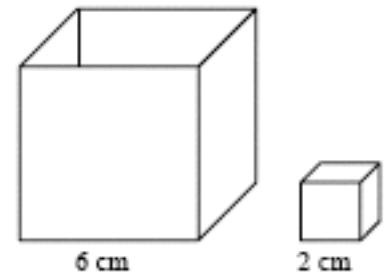
13. One year a monthly calendar looked like the diagram below. The sum of the numbers in one of the 3x3 arrays of this calendar is 162. What is the smallest number in that 3x3 array?

M	Tu	W	Th	F	Sa	Su
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

- A) 8      B) 9      C) 10      D) 16      E) 17

14. How many of the small cubes fit exactly into the big cube?

- A) 9      B) 12      C) 24      D) 27      E) 36

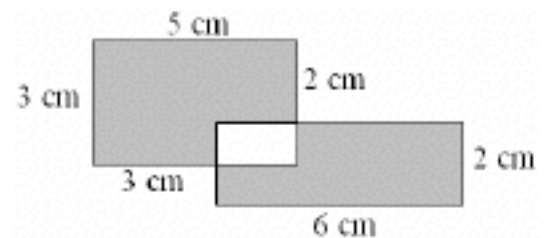


15. Which one of these five numbers is the greatest?

- A)  $\frac{1}{15} \div \frac{1}{18}$       B)  $\frac{1}{18} \div \frac{1}{15}$       C)  $\frac{1}{18} \times \frac{1}{15}$       D)  $\frac{1}{18} + \frac{1}{15}$       E)  $\frac{1}{15} - \frac{1}{18}$

16. The figure is a combination of two overlapping rectangles as shown. The shaded area, in square cm, is

- A) 19      B) 23      C) 24      D) 25      E) 26



17. The shape on the right is made up of three rectangles, each measuring 3 cm by 1 cm. What is the perimeter of this shape, in cm.?

- A) 16      B) 18      C) 20      D) 24      E) cannot be determined



18. Alice eats  $\frac{1}{4}$  of a pizza. Bob then eats  $\frac{1}{3}$  of what is left and, finally, Chris eats  $\frac{1}{2}$  of the remaining pizza. What fraction of the pizza is left.?

- A)  $\frac{1}{24}$       B)  $\frac{1}{12}$       C)  $\frac{1}{6}$       D)  $\frac{1}{4}$       E)  $\frac{1}{3}$

19. A store advertises "Buy one, get the second one at half price." For this offer, the average cost per item is the same as

- A) two for the price of one      B) three for the price of one      C) three for the price of two  
D) four for the price of three      E) five for the price of four

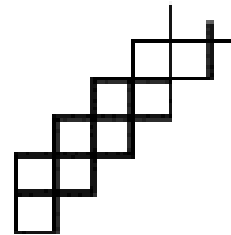
20. The integers greater than 1 are arranged in an array with 5 columns as shown. In which column is 2008?

- A) A      B) B      C) C      D) D      E) E

A	B	C	D	E
	2	3	4	5
9	8	7	6	
	10	11	12	13
17	16	15	14	

21. A shape consisting of 2008 small squares is made by continuing the pattern shown in the diagram. The small squares have sides of length 1 cm. What is the perimeter, in cm., of the entire shape?

- A) 4016      B) 4018      C) 6020      D) 6024      E) 8024

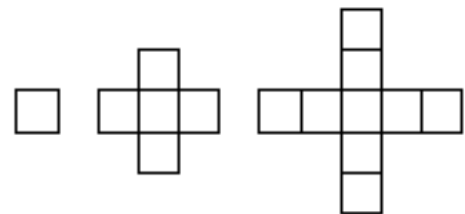


22. If you pick a positive factor of 144 at random, what is the probability that it is a perfect square?

- A)  $\frac{1}{5}$       B)  $\frac{4}{15}$       C)  $\frac{1}{3}$       D)  $\frac{2}{5}$       E)  $\frac{7}{15}$

23. It takes four toothpicks to build the first figure in this set. How many toothpicks are needed to build the tenth figure?

- A) 112      B) 118      C) 120      D) 124      E) 136

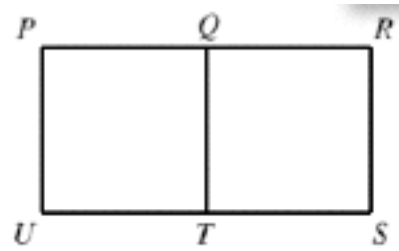


24. The letters A, B, and C represent three different non-zero digits. The value of  $A + B + C$  is

- A) 15      B) 16      C) 17      D) 18      E) 19

$$\begin{array}{r} AA \\ BB \\ + CC \\ \hline ABC \end{array}$$

25. The figure shows rectangle PRSU and segment QT that divides the rectangle into two congruent squares. How many right-angled triangles can be drawn using three of the points {P, Q, R, S, T, U} as vertices?



- A) 8      B) 9      C) 10      D) 12      E) 14

26. Between 1875 – 1878, there was a 20¢ U.S. coin which will be called a *twent*. A jar of coins has many nickels (worth 5 cents), dimes (worth 10 cents), and *twents*. You pick out three coins. How many possibilities are there for the total value of the three coins?

- A) 7      B) 8      C) 9      D) 10      E) 27

27. How many whole numbers between 99 and 999 are divisible by 4, 6, and 9?

- A) 13      B) 24      C) 25      D) 27      E) 31

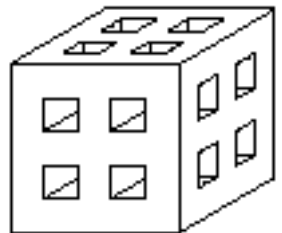
28. A solid wooden cube is painted red on the outside. The cube is then cut into 8 smaller cubes of equal size. What fraction of the total surface area of these 8 cubes is painted red?

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

29. Two six-sided dice each have two red, two yellow, and two blue faces. If we roll the dice, what is the probability that both dice show matching colors?

- A)  $\frac{1}{36}$       B)  $\frac{1}{27}$       C)  $\frac{1}{9}$       D)  $\frac{1}{6}$       E)  $\frac{1}{3}$

30. In a 5 by 5 by 5 cube, four symmetrically placed 1 by 1 square holes are cut perpendicular to each face all the way through to the opposite face as shown. How many small 1 by 1 by 1 cubes are left after this construction?



- A) 73      B) 75      C) 81      D) 96      E) 105