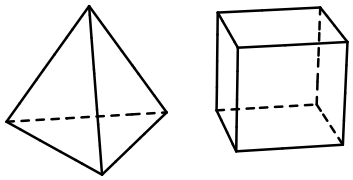
3 point problems

PROBLEM 01
Which of the following has the largest value?

(A) 2011^1 (B) 1^{2011} (C) 1×2011 (D) $1 + 2011$ (E) $1 \div 2011$

PROBLEM 02
Elsa plays with tetrahedrons and cubes.



She has 5 cubes and 3 tetrahedrons. How many faces are there in total?

(A) 42 (B) 48 (C) 50 (D) 52 (E) 56

PROBLEM 03
A zebra crossing has alternate white and black stripes, each of width 50 cm. The crossing starts and ends with a white stripe and has 8 white stripes in all. What is the total width of the crossing?

(A) 7 m (B) 7.5 m (C) 8 m (D) 8.5 m (E) 9 m

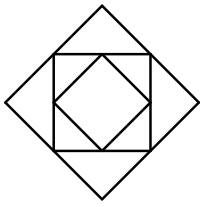
PROBLEM 04
My broken calculator divides instead of multiplying and subtracts instead of adding. I type $(12 \times 3) + (4 \times 2)$. What answer does the calculator show?

(A) 2 (B) 6 (C) 12 (D) 28 (E) 38

PROBLEM 05
My digital watch has just changed to show the time 20:11. How many minutes later will it next show a time with the digits 0, 1, 1, 2 in some order?

(A) 40 (B) 45 (C) 50 (D) 55 (E) 60

PROBLEM 06
The diagram shows three squares.



The medium square is formed by joining the midpoints of the large square. The small square is formed by joining the midpoints of the medium square. The area of the small square in the figure is 6 cm^2. What is the difference between the area of the medium square and the area of the large square?

(A) 6 cm^2 (B) 9 cm^2 (C) 12 cm^2 (D) 15 cm^2 (E) 18 cm^2

PROBLEM 07

In my street there are 17 houses. On the `even' side, the houses are numbered 2, 4, 6, and so on. On the `odd' side, the houses are numbered 1, 3, 5, and so on. I live in the last house on the even side, which is number 12. My cousin lives in the last house on the odd side. What is the number of my cousin's house?

(A) 5 (B) 7 (C) 13 (D) 17 (E) 21

PROBLEM 08

Felix the Cat caught 12 fish in three days. Each day after the first he caught more fish than the previous day. On the third day he caught fewer fish than the first two days together. How many fish did Felix catch on the third day?

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

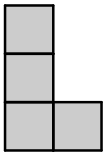
PROBLEM 09

Mary lists every 3-digit number whose digits add up to 8. What is the sum of the largest and the smallest numbers in Mary's list?

(A) 707 (B) 907 (C) 916 (D) 1000 (E) 1001

PROBLEM 10

The diagram shows an L-shape made from four small squares.



Ria wants to add an extra small square in order to form a shape with a line of symmetry. In how many different ways can she do this?

(A) 1 (B) 2 (C) 3 (D) 5 (E) 6

4 point problems

PROBLEM 11

What is the value of $\frac{2011 \times 2.011}{201.1 \times 20.11}$?

(A) 0.01 (B) 0.1 (C) 1 (D) 10 (E) 100

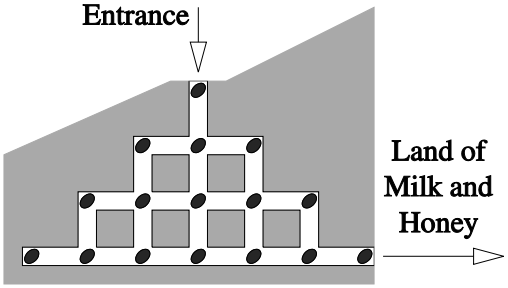
PROBLEM 12

Marie has 9 pearls that weigh 1 g, 2 g, 3 g, 4 g, 5 g, 6 g, 7 g, 8 g, and 9 g. She makes four rings, using two pearls on each. The total weight of the pearls on each of these four rings is 17 g, 13 g, 7 g and 5 g, respectively. What is the weight of the unused pearl?

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

PROBLEM 13

Hamster Fridolin sets out for the Land of Milk and Honey. His way to the legendary Land passes through a system of tunnels. There are 16 pumpkin seeds spread through the tunnels, as shown in the picture.

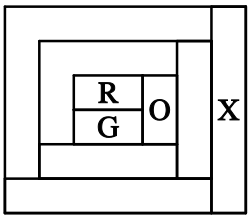


What is the highest number of pumpkin seeds Fridolin can collect if he is not allowed to visit any junction more than once?

(A) 12 (B) 13 (C) 14 (D) 15 (E) 16

PROBLEM 14

Each region in the figure is coloured with one of four colours: red (R), green (G), orange (O), or yellow (Y). (The colours of only three regions are shown.)



Any two regions that touch have different colours. The colour of the region X is

(A) red (B) orange (C) green (D) yellow (E) impossible to determine

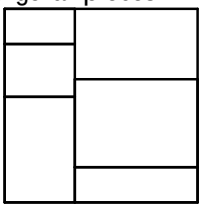
PROBLEM 15

A teacher has a list of marks: 17, 13, 5, 10, 14, 9, 12, 16. Which two marks can be removed without changing the average?

(A) 12 and 17 (B) 5 and 17 (C) 9 and 16 (D) 10 and 12 (E) 10 and 14

PROBLEM 16

A square piece of paper is cut into six rectangular pieces.



When the perimeter lengths of the six pieces are added together the result is 120 cm. What is the area of the square piece of paper?

(A)48 cm^2 (B) 64 cm^2 (C) 110.25 cm^2 (D) 144 cm^2 (E) 256 cm^2

PROBLEM 17

In three games FC Barcelona scored three goals and let one goal in. In these three games, the club won one game, drew one game and lost one game. What was the score in the game FC Barcelona won?

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

PROBLEM 18

Lali draws a line segment DE of length 2 cm on a piece of paper. How many different points F can she draw on the paper so that the triangle DEF is right-angled and has area 1 cm^2?

(A) 2 (B) 4 (C) 6 (D) 8 (E) 10

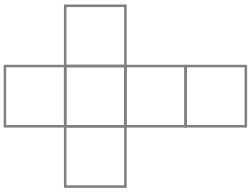
PROBLEM 19

The positive number a is less than 1, and the number b is greater then 1. Which of the following numbers has the largest value?

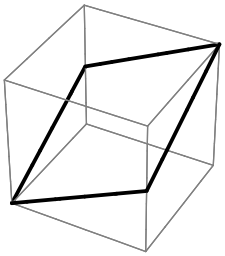
(A) $a \times b$ (B) $a + b$ (C) $a \div b$ (D) b (E) the answer depends on a and b.

PROBLEM 20

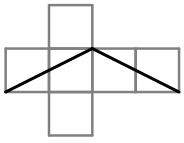
The figure shows a net which is cut out of paper and folded to make a cube.

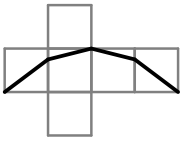


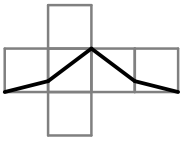
A dark line is then drawn on the cube, as shown, dividing the surface of the cube into two identical parts.

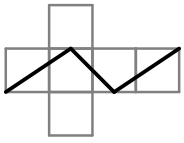


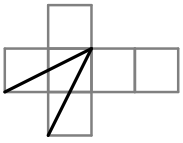
The cube is then unfolded. The paper could now look like only one of the following. Which one?

(A)


(B)


(C)


(D)


(E)


5 point problems

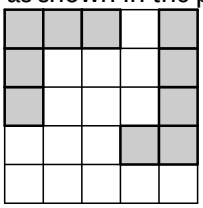
PROBLEM 21

The five-digit number `24X8Y' is divisible by 4, 5 and 9. What is the sum of the digits X and Y?

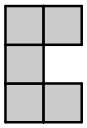
(A) 13 (B) 10 (C) 9 (D) 5 (E) 4

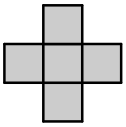
PROBLEM 22

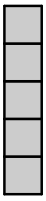
Lina has fixed two shapes on a 5 × 5 board, as shown in the picture.

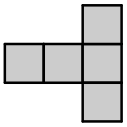


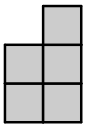
Which of the following 5 shapes should she place on the empty part of the board so that none of the remaining 4 shapes will fit in the empty space that is left? (The shapes may be rotated or turned over, but can only be placed so that they cover complete squares.)

(A) 

(B) 

(C) 

(D) 

(E) 

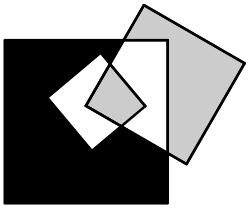
PROBLEM 23

The three blackbirds Isaac, Max and Oscar are each on their own nest. Isaac says: ``I am more than twice as far away from Max as I am from Oscar". Max says: "I am more than twice as far away from Oscar as I am from Isaac". Oscar says: "I am more than twice as far away from Max as I am from Isaac". At least two of them are telling the truth. Who is lying?

(A) Isaac (B) Max (C) Oscar (D) none of them (E) impossible to tell

PROBLEM 24

The figure shows a square with side 3 cm inside a square with side 7 cm, and another square with side 5 cm which intersects the first two squares.



What is the difference between the area of the black region and the total area of the grey regions?

(A) 0 cm^2 (B) 10 cm^2 (C) 11 cm^2 (D) 15 cm^2 (E) impossible to determine

PROBLEM 25

Myshko shot at a target. When he hit the target he only hit 5, 8 and 10. Myshko hit 8 and 10 the same number of times. He scored 99 points in total, and 25\% of his shots missed the target. How many times did Myshko shoot at the target?

(A) 10 (B) 12 (C) 16 (D) 20 (E) 24

PROBLEM 26

In a convex quadrilateral $ABCD$ with $AB = AC$, the following angles are known: $\measuredangle BAD = 80°$, $\measuredangle ABC = 75$, $\measuredangle ADC = 65°$. What is the size of $\measuredangle BDC$?

(A) 10° (B) 15° (C) 20° (D) 30° (E) 45°

PROBLEM 27

Seven years ago Evie's age was a multiple of 8, and in eight years' time her age will be a multiple of 7. Eight years ago Raph's age was a multiple of 7, and in seven years' time his age will be a multiple of 8. Neither Evie nor Raph is over a hundred years old. Which of the following statements is true?

(A) Raph is two years older than Evie | (B) Raph is one year older than Evie | (C) Raph and Evie are the same age | (D) Raph is one year younger than Evie | (E) Raph is two years younger than Evie

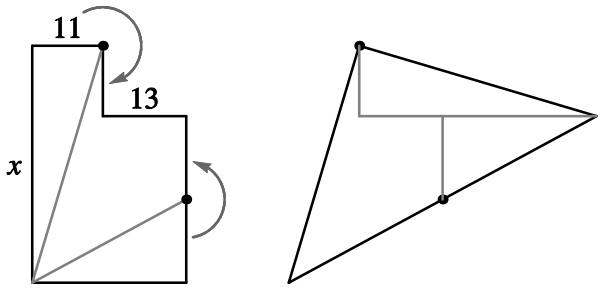
PROBLEM 28

In the expression $\frac{K \cdot A \cdot N \cdot G \cdot A \cdot R \cdot O \cdot O}{G \cdot A \cdot M \cdot E}$ different letters stand for different non-zero digits, but the same letter always stands for the same digit. What is the smallest possible positive integer value of the expression?

(A) 1 (B) 2 (C) 3 (D) 5 (E) 7

PROBLEM 29

The left-hand figure shows a shape consisting of two rectangles. The lengths of two sides are marked: 11 and 13. The shape is cut into three parts and the parts are rearranged into a triangle, as shown in the right-hand figure.



What is the length marked x?

(A) 36 (B) 37 (C) 38 (D) 39 (E) 40

PROBLEM 30

Mark plays a computer game on a 4×4 grid. Initially the 16 cells are all white; clicking one of the white cells changes it to either red or blue. Exactly two cells will become blue and they will always have a side in common. The aim is to make both blue cells appear in as few clicks as possible. With perfect play, what is the largest number of clicks Mark will ever need to make?

(A) 9 (B) 10 (C) 11 (D) 12 (E) 13