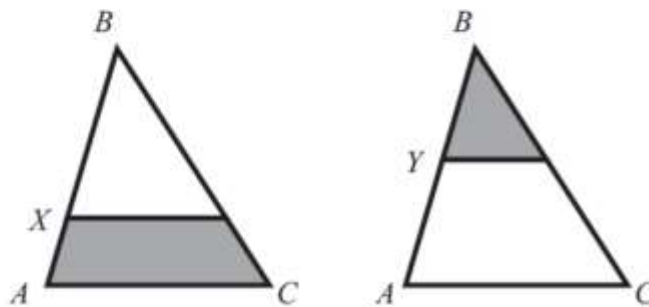


Problemo Questions – Level 2

Triangles 4

In the triangle ABC , we can draw a line parallel to its base AC , through point X or Y .



The areas of the shaded regions are the same.

The ratio $BX : XA = 4 : 1$

What is the ratio $BY : YA$?

1 : 1

2 : 1

3 : 1

3 : 2

4 : 3

Dice 2

Standard six-sided dice have their dots arranged so that the opposite faces add up to 7.

If 27 standard dice are arranged in a $3 \times 3 \times 3$ cube on a solid table what is the maximum number of dots that can be seen from one position?

90

94

153

154

189

Alphabet

Given five different positive integers a, b, c, d, e , we know that $c : e = b$, $a + b = d$ and $e - d = a$.

Which of the numbers a, b, c, d, e is the largest?

a

b

c

d

e

Dice 3

Bibi has a die with the numbers 1, 2, 3, 4, 5, 6 on its six faces.

Tina has a die which is special: it has the numbers 2, 2, 2, 5, 5, 5 on its six faces.

When Bibi and Tina roll their dice, the one with the larger number wins.

If the two numbers are equal, it is a draw.

What is the probability that Tina wins?

$\frac{1}{3}$

$\frac{7}{18}$

$\frac{5}{12}$

$\frac{1}{2}$

$\frac{11}{18}$

KLR

If $K = L + \frac{6}{R}$ and $L = 4$ and $K = 7$, then R equals

-18

1

12

8

2

Fractions 3

If $\frac{p}{p-2q} = 3$ then $\frac{p}{q}$ equals

-3

3

$\frac{1}{3}$

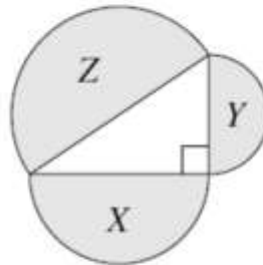
$\frac{2}{3}$

2

Next Problem →

Semicircles

Three semicircles have diameters which are the sides of a right-angled triangle.



Their areas are $X \text{ cm}^2$, $Y \text{ cm}^2$ and $Z \text{ cm}^2$, as shown.

Which of the following is true:

$X + Y < Z$

$\sqrt{X} + \sqrt{Y} = \sqrt{Z}$

$X + Y = Z$

$X^2 + Y^2 = Z$

$X^2 + Y^2 = Z^2$

Square Root

Question:

$$\sqrt{(2015 + 2015) + (2015 - 2015) + (2015 \times 2015) + (2015 \div 2015)} =$$

$\sqrt{2015}$

2015

2016

2017

4030

Petrol

Starting with $\frac{2}{3}$ of a tank of fuel, I set out to drive the 550km from Scone to Canberra.

At Morisset, 165km from Scone, I have $\frac{1}{2}$ of a tank remaining.

If I continue with the same fuel consumption per kilometre and without refuelling, what happens?

I will arrive in Canberra with $\frac{1}{9}$ of a tank to spare.

I will arrive in Canberra with $\frac{1}{20}$ of a tank to spare.

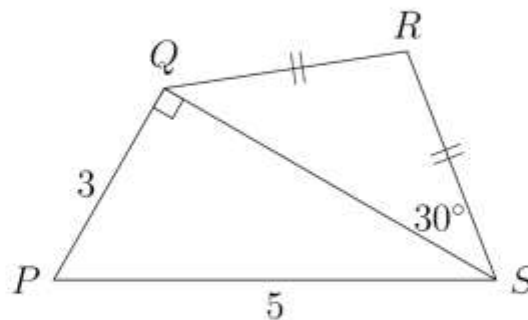
I will run out of fuel precisely when I reach Canberra.

I will run out of fuel 110 km from Canberra.

I will run out of fuel 220 km from Canberra.

Triangles 2

In the diagram, $PS = 5$, $PQ = 3$, $\triangle PQS$ is right-angled at Q , $\angle QSR = 30^\circ$ and $QR = RS$.



What is the length of RS ?

$$\frac{\sqrt{3}}{2}$$

$$\sqrt{3}$$

$$2$$

$$\frac{4\sqrt{3}}{3}$$

$$4$$

Twos 2

The sequence

$$2, 2^2, 2^{2^2}, 2^{2^{2^2}}, \dots$$

is defined by $a_1 = 2$ and $a_{n+1} = 2^{a_n}$ for all $n \geq 1$.

What is the first term in the sequence greater than 1000^{1000} ?

$$a_4 = 2^{2^{2^2}}$$

$$a_5 = 2^{2^{2^{2^2}}}$$

$$a_6 = 2^{2^{2^{2^{2^2}}}}$$

$$a_7 = 2^{2^{2^{2^{2^{2^2}}}}}$$

$$a_8 = 2^{2^{2^{2^{2^{2^{2^{2^2}}}}}}}$$

Functions 1

Given that $f_1(x) = \frac{x}{x+1}$ and $f_{n+1}(x) = f_1(f_n(x))$, then $f_{2014}(x)$ equals

$$\frac{x}{2014x+1}$$

$$\frac{2014x}{2014x+1}$$

$$\frac{x}{x+2014}$$

$$\frac{2014x}{x+1}$$

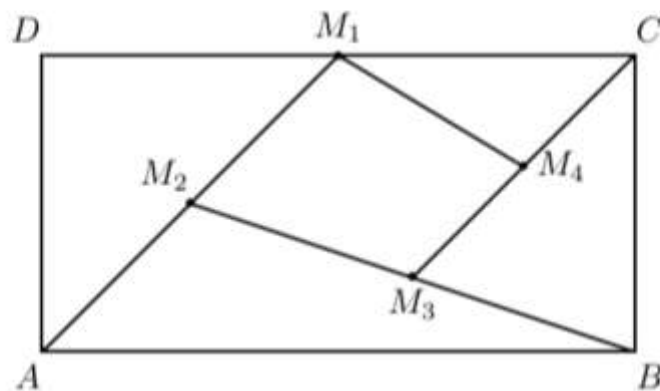
$$\frac{x}{2014(x+1)}$$

Numbers 2

What is the largest three-digit number with the property that the number is equal to the sum of its hundreds digit, the square of its tens digit and the cube of its units digit?

Vicious rectangle

In the rectangle $ABCD$ shown in the figure, M_1 is the midpoint of DC , M_2 is the midpoint of AM_1 , M_3 is the midpoint of BM_2 and M_4 is the midpoint of CM_3 .



Find the ratio between the areas of the quadrilateral $M_1M_2M_3M_4$ and of the rectangle $ABCD$.

$$\frac{7}{16}$$

$$\frac{3}{16}$$

$$\frac{7}{32}$$

$$\frac{9}{32}$$

$$\frac{1}{5}$$