| Subject: | Math as a 'universal language'. Common Core <br> Maths in English, English in Maths |
| :--- | :--- |
| Aims: | Familiarizing students with the basic English vocabulary from several <br> areas of mathematics (number, algebra, geometry, trigonometry, <br> probability, ratio and proportion). <br> Practicing students' skills with the math exercises. |
| Assumed knowledge: | Students will understand and be able to use the language, identify <br> symbols and notation of mathematics |
| Anticipated problems: | Students may have problems with using the new vocabulary |
| Teaching aids: | Online Video Teaching; worksheets |

## Sources:

https://www.youtube.com
www.mathsisfun.com
http://www.coolmath.com/
https://en.wikipedia.org
https://riddlesbrainteasers.com
http://mathforum.org
http://www.educationquizzes.com

## Triangles

Scalene ['skei.liin ] Triangle has no equal angles and no equal sides
Isosceles [ai'sכsili:z ] Triangle has two sides of equal length and two angles of the same measure
Equilateral [i..kwi'læt.ər.əl ] Triangle has all sides the same length and all angles measuring $60^{\circ}$
Acute [ $\partial^{\prime}$ kju:t ] Triangle has all three angles measuring less than $90^{\circ}$
Right Triangle has one angle measuring exactly $90^{\circ}$
Obtuse [ $\partial b$ 'tju:s ] Triangle has one angle greater than $90^{\circ}$

## Exercise 1

Draw a proper figure:
an acute triangle
a scalene triangle
a right triangle

## Exercise 2

Which of the following correctly describes this triangle?

A. It is a right isosceles triangle
B. It is an obtuse isosceles triangle
C. It is an obtuse scalene triangle

## Exercise 3

Which of the following is NOT possible?
A An obtuse isosceles triangle
B An acute isosceles triangle
C An obtuse equilateral triangle
D An acute equilateral triangle

## Exercise 4

The area of the triangle is 22.5 units. The height $h$ is 5 . What is the length of the base of the triangle?

A 5
B7 C8
D 9

## Exercise 5

Match the definition with the right formula
Definition: In a right angled triangle the square of the long side is equal to the sum of the squares of the other two sides.
$A a^{2}+2 b=2 c^{2} B$
$2 a b+2 b c=2 a c$
C $a^{2}+b^{2}=c^{2}$
D $2 \mathrm{ab}=2 \mathrm{c}$

What theorem is this?

## Circle


radius - promień
diameter- średnica
chord - cięciwa
area - pole
circumference - obwód

## Exercise 6

Match the formulas with the expressions

| $L=2 \pi r$ | diameter |
| :--- | :--- |
| $P=\pi r^{2}$ | radius |
| $r=1 / 2 d$ | circumference of a circle |
| $d=2 r$ | area of a circle |

## Exercise 7

What is the circumference of a circle with a diameter of 5 ?
A 25 п
В 10п
C 5 $\quad$
D 25/4п

## Exercise 8

What is the area of a circle with a radius of 3 ?
A 36ா
В $3 \pi$
C 6п
D 9п

## Exercise 9

What is the diameter of a circle with an area of $64 \pi$ ?
A 4
B 16
C 32
D 8

## Probability

## Exercise 10

There are 5 white balls, 8 red balls, 7 yellow balls and 4 green balls in a container. A ball is chosen at random.


What is the probability of choosing red?
What is the probability of choosing either red or white?
What is the probability of choosing neither white nor green?
What is the probability of choosing a ball other than yellow?
What is the probability of choosing black?

## Logic

## Exercise 11

Kevin, Joseph, and Nicholas are 3 brothers. If the following statements are all true, which of them is the youngest?
o Kevin is the oldest.
o Nicholas is not the oldest.
o Joseph is not the youngest.


A Kevin B Nicholas C Joseph

## Exercise 12

You have a basket containing ten apples. You have ten friends, who each desire an apple. You give each of your friends one apple.
Now all your friends have one apple each, yet there is an apple remaining in the basket. How?

## Radicals / Roots pierwiastki

The expression $\sqrt{ } 9$ is read as "root nine", "radical nine", or "the square root of nine"
$\sqrt{ } 64=8$ - the square root of 64 is 8
$\sqrt{ } x \Rightarrow \sqrt{ }$ is the radical sign and $x$ is called the radicand
A cube (third) root is written as: $\sqrt[3]{ }^{3}$
$\sqrt[3]{9}=3$ - the cube root of 9 is 3

## Exercise 13

What is the radicand of root four hundred and forty one?
What is the radicand of a cube root of three hundred and forty three?

## Exercise 14

## Estimating Square Roots

Use your square root estimation skills and choose the right option $\sqrt{5}$
A is between 1 and 2 $\sqrt{42}$
$B$ is between 4 and 5
A is between 6 and 7
$C$ is between 2 and 3
$B$ is between 7 and 8
$C$ is between 5 and 6

## Exercise 15

## Ratio and proportion

The ratio boys to girls in my class is $3: 4$. If there are 12 boys, how many girls are there in my class?
A 10
B 9
C 14
D 16

## Exercise 16

How many legs (total ) does 4 dogs, 2 elephants, 15 cats, and 26 people have?
A. 98
B. 110
C. 136
D. 142

## Exercise 17

Joe counts 48 heads and 134 legs among the chickens and dogs on his farm. How many dogs and how many chickens does he have?

## Exercise 18

You walk into a room and see a bed. On the bed there are two dogs, four cats, a giraffe, a cow and three ducks. There are also four chickens flying above the bed. How many legs are there on the floor?
A 38
B 6
C 46
D 4

## Exercise 18

I travel a lot and meet both the rich and the poor, but nobody knows where I am going next. I'm invisible but you can see what I do. Who or what am I?

## Exercise 19

A French tourist was driving in the USA when he noticed a signpost that said: Denver 125 miles. If 5 miles is equivalent to 8 km , how far away from Denver is this in kilometres?

$$
1 \text { mile=1,609344 km (1,61) }
$$

A. 320 kilometres
B. 201 kilometres
C. 152 kilometres
D. 12,5 kilometres

## Exercise 20

Mario has just arrived in the UK from Italy. Today he is shopping in the market, but he is extremely confused: at the greengrocer's all the weights are in pounds (lb). Fortunately, the greengrocer can convert pounds weight to kilos. In the end, Mario bought 6 lb of potatoes, 2 lb of apples and 1 lb of bananas. If 1 kg is equivalent to $2,2 \mathrm{lb}$, what is the total weight of the groceries?
A. $26,4 \mathrm{~kg}$
B. 7 kg
C. $5,5 \mathrm{~kg}$
D. $1,2 \mathrm{~kg}$

## Exercise 21

Farmer Giles likes to think of himself as a modern farmer. He says that his farm occupies an area of 1011750 m 2 (one million eleven thousand seven hundred and fifty square metres). Farmer Morris is a bit old fashioned and he uses the word 'acre' when he is talking about the size of his farm. He says that his farm, which occupies 250 acres, is larger than farmer Gile's farm. Whose farm is larger?
A. Farmer Gile's farm
B. Farmer Morris's farm
C. Can't say because the units of area are different
D. They are both the same size.

One acre is equivalent to an area of 4047 m 2 .

