Math and Physics are easy!!!

15.01.2014.

PLAN OF THE LESSON

"WARMING-UP"

10 QUESTIONS ABOUT MATH

WORKSHEET ABOUT PHYSICISTS

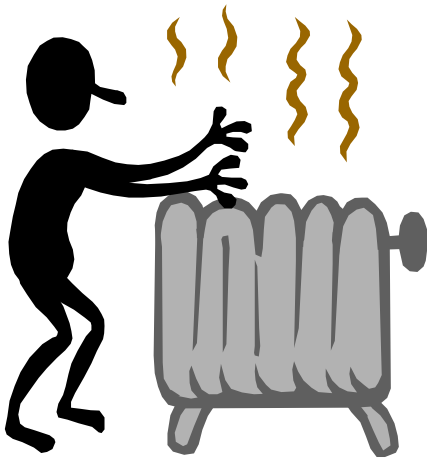
AWARDS

“WARMING-UP”

Each team has only 1 minute to answer as many questions as you can and each correct answer is worth 1 point.

If the team does not know the answer to the question, it should be passed, saying, “the next one“.

You have to score as many points as you can!



"WARMING-UP" QUESTIONS

- The first letter of the Greek alphabet is …
  - alpha
- What is the smallest positive integer?
  - 1
- The side opposite the right angle in the right triangle is called …
  - the hypotenuse
- What is the sum of all numbers from –200 to 200?
  - zero
- What is the greatest negative integer?
  - – 1

"WARMING-UP" QUESTIONS

- A chord that passes through the center of the circle is called ...
  - a diameter
- Parallelogram with all right angles is called
  - a rectangle
- What is a statement you accept as true without proof?
  - axiom
- Two lines that intersect and form right angles are called
  - perpendicular lines
- What is the perimeter of a square if the area is 49 square cm?
  - 28 cm

"WARMING-UP" QUESTIONS

- How many times bigger is a square kilometer than a square meter?
  - 1 million times
- The smallest prime is …
  - 2
- How many minutes are there in 2 hours?
  - 120 min
- The result of the addition is called …
  - a sum
- Can a triangle have two obtuse angles? …
  - No

"WARMING-UP" QUESTIONS

- Quadrangle in which all sides are equal is called …
  - a rhombus
- How many days are there in the summer holidays in Latvia?
  - 92
- What is the formula for the discriminant?
  - $b^2 - 4ac$
- The legs of the right triangle are 6 and 8 long. What is the area of this triangle?
  - 24
- What is the next prime number after 7?
  - 11

"WARMING-UP" QUESTIONS

- The perimeter of a circle is also known as what?
  - The circumference
- What does the square root of 144 equal?
  - 12
- **True or false**? Pi can be correctly written as a fraction.
  - False
- What is the smallest two digit number?
  - 10
- The second letter of the Greek alphabet is called…
  - beta

"WARMING-UP" QUESTIONS

- How many sides does a nonagon have?
  - 9
- What is the next number in the Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21, 34, ...?
  - 55
- In statistics the middle value of an ordered set of values is called what?
  - The median
- 5 to the power of 0 equals with what?
  - 1
- If it takes 3 men 2 hours to dig a hole, how long will it theoretically take for one man?
  - 6 hours

next

"WARMING-UP" QUESTIONS

- If the discriminant is less than zero, how many real solutions does the equation have?
  - 0
- How many faces does a cube have?
  - 6
- What's the top number of a fraction called?
  - The numerator.
- What word describes a number system with a base of two?
  - Binary.
- What is the sum of the first 2 prime numbers?
  - 5

next

"WARMING-UP" QUESTIONS

- A line that cuts an angle into two equal parts is called…
  - angle bisector
- The result of multiplication is called …
  - the product
- Rectangle with equal sides is called …
  - A square
- How many years are in one century?
  - one hundred
- With what number you cannot divide?
  - zero

next

"WARMING-UP" QUESTIONS

- Hundredth part of the number is called …
  - a percent
- By dividing distance by the time we can find…
  - a speed
- What is the largest two digit number?
  - 99
- Rectangle has the length 3 cm and width 2 cm. The perimeter is …
  - 10
- 1000 meters are equal to 1 …
  - kilometer

next

"WARMING-UP" QUESTIONS

- Sum of lengths of sides of the polygon is called …
  - A perimeter
- What is 1 % of a meter?
  - centimeter
- What is a quadrilateral with two sides not parallel and two sides parallel?
  - Trapezoid
- How many lines can be drawn through two points?
  - Only one
- Name of the function $y = kx + b$ is …
  - linear function

next

"WARMING-UP" QUESTIONS

- Graph of a quadratic function is called …
  - a parabola
- What do a plant and the equation have?
  - A root
- What is the name of the bottom part of the fraction?
  - A denominator
- A quarter of one hundred is …
  - 25
- What is the result of the subtraction?
  - Difference

next

"WARMING-UP" QUESTIONS

- What is the sum of the angles of a triangle?
  - 180^0
- How many diagonals can be drawn in a triangle?
  - 0
- What sign is cos α in the second quadrant?
  - minus
- A polynomial equation with two terms usually joined by a plus or minus sign is called
  - a binomial
- The result of division is called ...
  - the quotient

next

QUESTIONS ABOUT MATH

You will get questions related to mathematics.

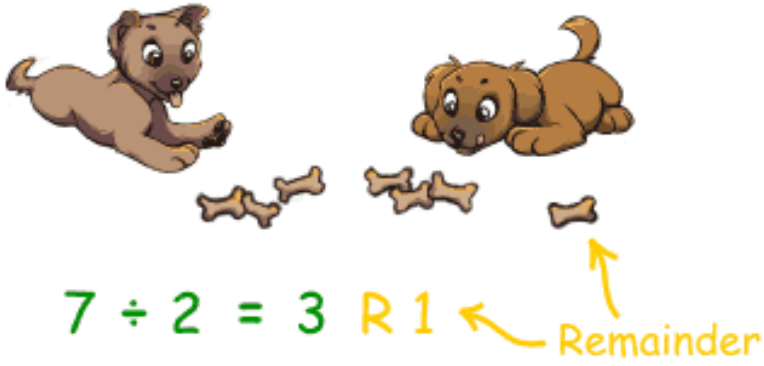
You only get one minute to think, after which the answer should be written on a piece of paper and given to me. The correct answer with short explanations (if necessary) is valued at 2 points.

We will evaluate correctness and completeness of the answers.

Question 1

When the positive integer k is divided by 7, the remainder is 6.

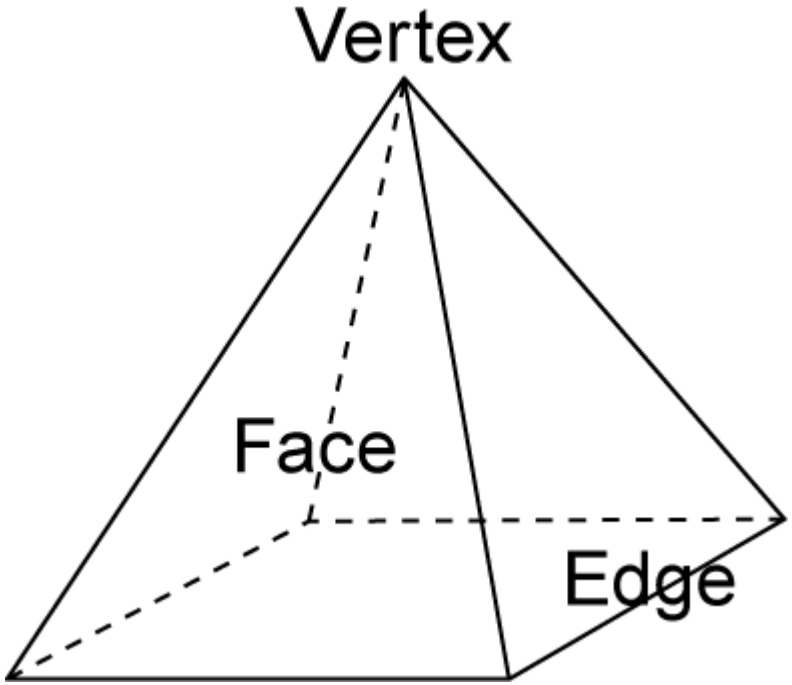
What is the remainder when $k + 2$ is divided by 7?



Answer 1

Question 2

The pyramid has altitude h and the square base of side m. The four edges that meet at the vertex of the pyramid each have length e. If $e = m$, what is the value of h in terms of m?



Answer 2

$$\frac{m}{\sqrt{2}} \quad \text{or} \quad \frac{m\sqrt{2}}{2}$$

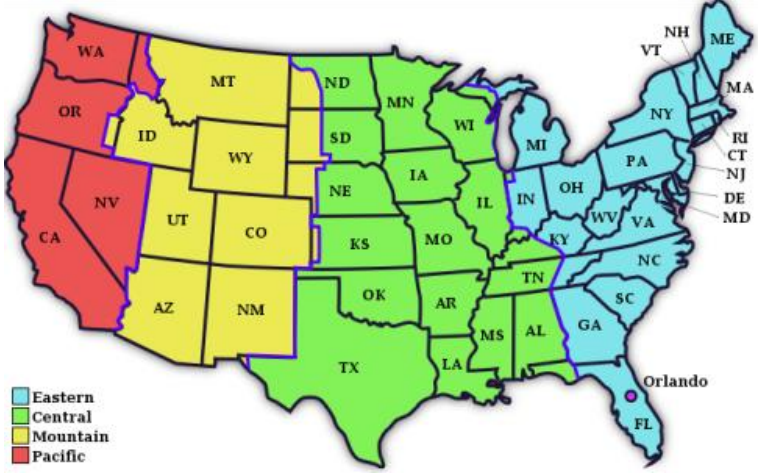
Question 3

How old was a person exactly 1 year ago if exactly x years ago the person was y years old?

Answer 3

$$y + x - 1$$

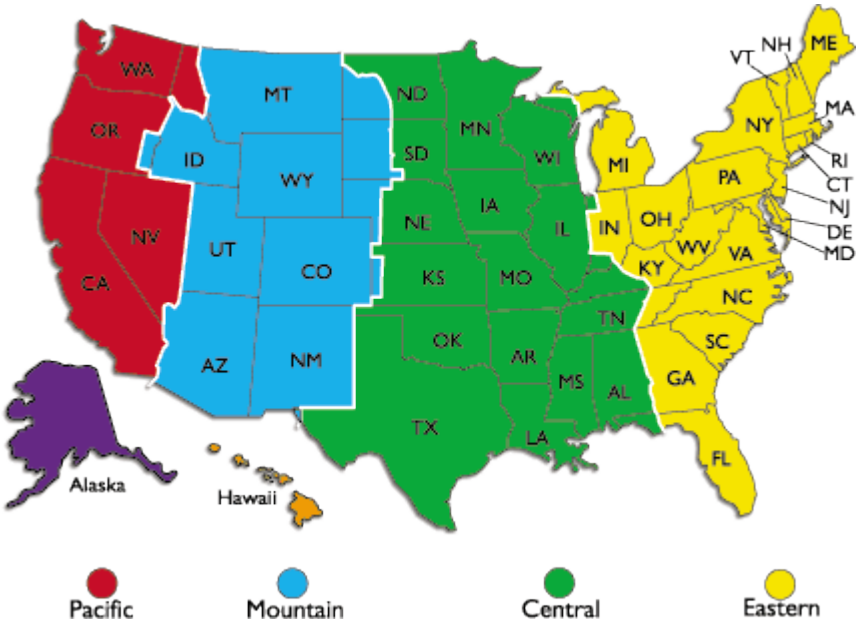
Question 4



When it is noon eastern standard time (EST) in New York City, then it is 9:00 AM. Pacific standard time (PST) in San Francisco. A plane took off from New York City at noon EST and arrived in San Francisco at 4:00 PM. PST on the same day. If the second plane left San Francisco at noon PST and took exactly the same amount of time for the trip, what was the planes arrival time (EST) in New York City?

Answer 4

10:00 PM EST



Question 5

State University plans on accepting a total of 1000 students for next year's class. Of the 800 students accepted so far, 60 percent are female and 40 percent are male. How many of the remaining students to be accepted must be male in order for half of the total number of students accepted would be male?

Answer 5

QUESTION 6

For all the numbers x and y, let the operation $\square$ be defined by $x \square y = xy - y$. If a and b are positive integers, which of the following can be equal to zero?

I. $a \square b$

II. $(a + b) \square b$

III. $a \square (a + b)$

(there may be more than one correct answer

Answer 6

I and III

I. if a = b = 1, than $a \square b = ab - b = 1 \cdot 1 - 1 = 0$

II. $(a + b) \square b = (a + b)\, b - b = ab - b^2 - b = b\,(a - b - 1)$

$\neq 0$ for all a and b

III. if $a = 1$, than $a \square (a + b) = a\,(a + b) - (a + b) = a^2 + ab - a - b$

$= a(a - 1) + b(a - 1) = (a - 1)(a + b) = (1 - 1)(a + b) = 0$

Question 7

The oldest child in the family is 5 years elder than her brother. The mother is 1 year younger than twice the sum of her children's ages, and the father's age equals the mother's age plus the son's age. If the sum of all four ages is three times the prime number and the mother is younger than 50 when she had her second child, how old is the daughter now?

Answer 7

13 years old

Question 8

The price of a telephone was first increased by 10 percent and then the new price was decreased by 25 percent. The final price was what percent of the initial price?

Answer 8

$$a + 0{,}1 \cdot a = 1{,}1a$$

$$1{,}1a - 0{,}25 \cdot 1{,}1a = 0{,}825\ a$$

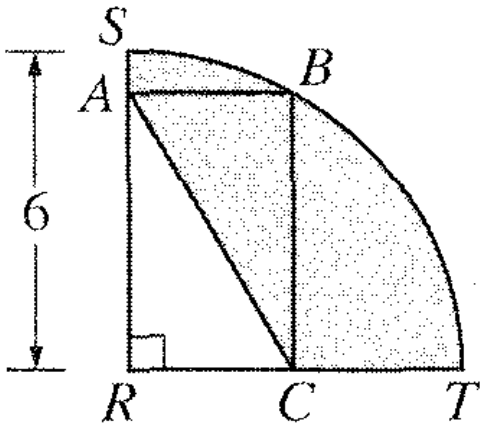
Question 9

If $|3 - k| = 10$ and $|m + 3| = 6$ what is the greatest value of $k - m$?

Answer 9

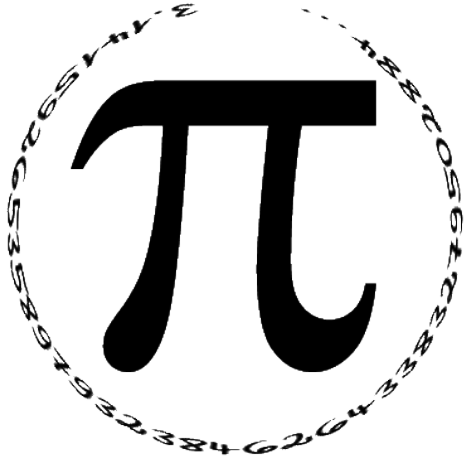
22

Question 10



In the figure above, arc *SBT* is one quarter of the circle with center R and radius 6. If the length plus the width of rectangle ABCR is 8, then the perimeter of the shared region is…

Answer 10



$$4 + 3\pi$$

About famous physicists…

You will receive a worksheet with images of banknotes. Portraits of famous physicists are displayed on banknotes.

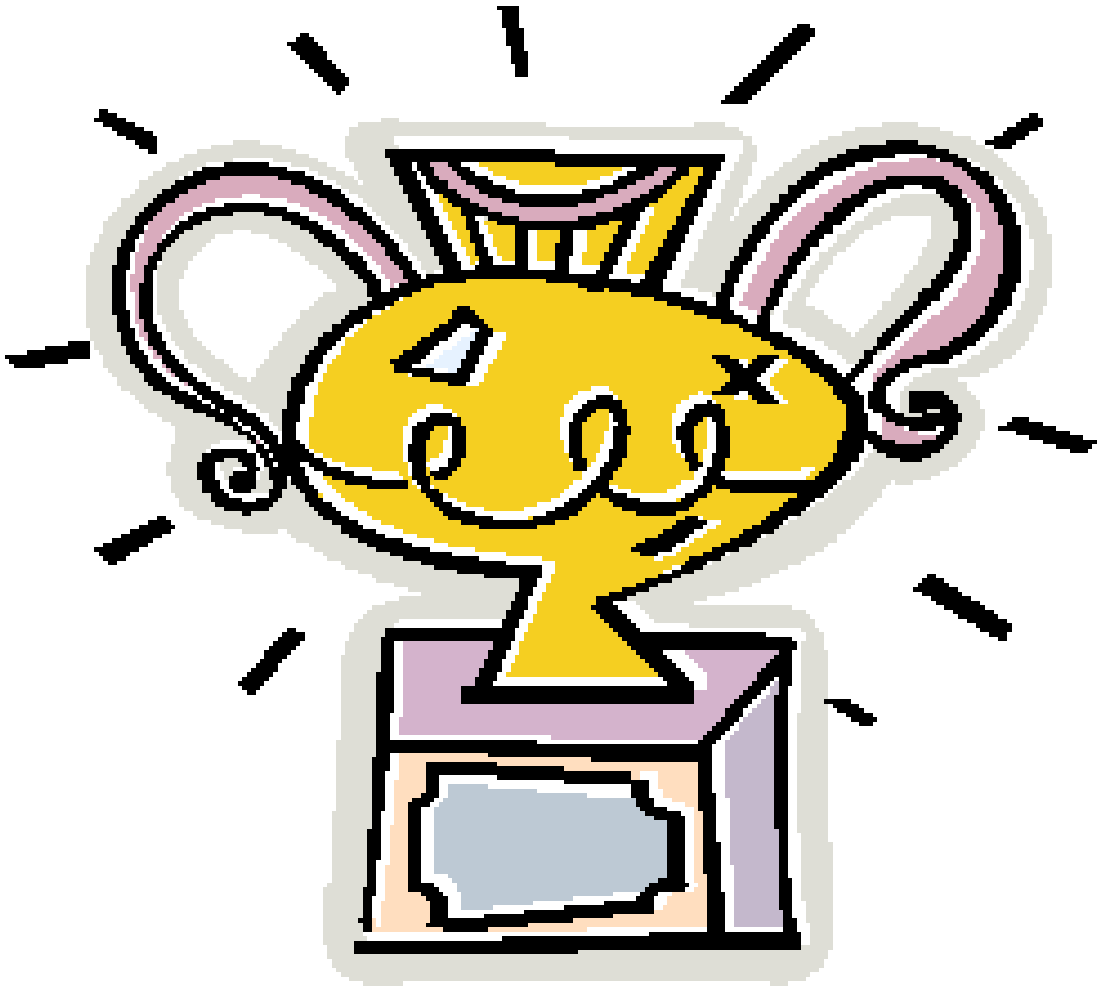
Your task is to calculate the cost of each portrait, the cost all these portraits in euros (EUR) and give the name of every physicist.

That team which answers the first will receive 2 bonus points.

Answer

The total cost for all portraits is 290.95 EUR

Presentation



Thank you for attention!!!