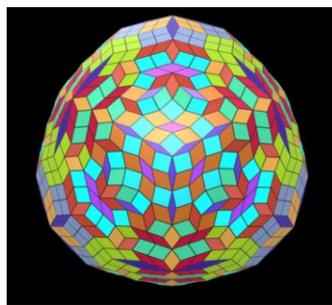
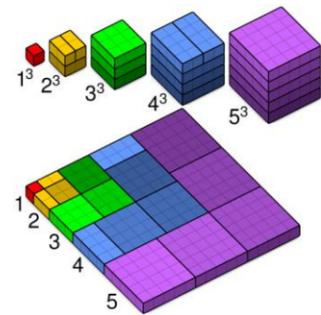


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MONDAY

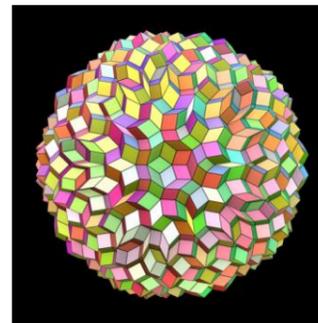


TUESDAY



WEDNESDAY

THURSDAY

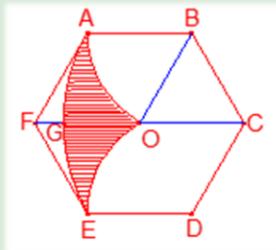


FRIDAY

SATURDAY

SUN.

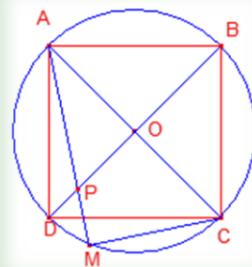
4



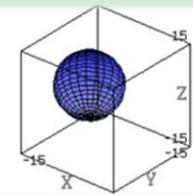
5

Let ABCDEF be a regular hexagon with centre O and side c. From B and D and with radius c two arcs are drawn: AO and EO. With centre at C and radius AC, the arc AGE is drawn. Find the area of the shaded area

6



11



Determine the equation of the sphere that passes through the points A (1, -2, -1); B (-5, 10, -1); C (4, 1, 11) and D (-8, -2, 2)

12

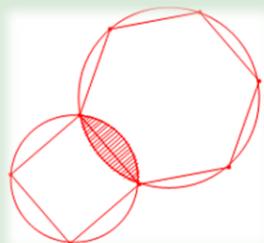


The figure is made up of a cube with edge a and two pyramids with a square base and height a. Determine area and volume of the body

13

Square ABCD is inscribed in a circle of radius 30. Chord AM measures 50 and intersects diagonal BD at point P. Find the measure of segment AP

18



25

On one side of a regular hexagon with side c a square has been drawn. Find the area of the intersection of the two circles circumscribed to the regular polygons

19

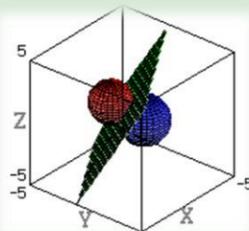
Given the spheres:

$$E_1 \equiv 2x^2 + 2y^2 + 2z^2 + 3x - 2y + z - 5 = 0$$

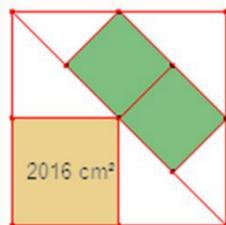
$$E_2 \equiv x^2 + y^2 + z^2 - x + 3y - 2z + 1 = 0$$

determines the relative position of E_1 and E_2 . If they are secants, find the plane where they intersect. Determine the centre and radius intersection of the spheres

20



26



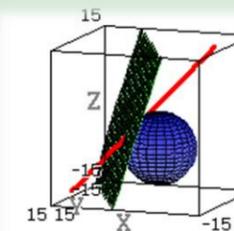
27

A square has been divided into two triangles on the diagonal. A square with area 2016 cm² has been inscribed in the lower triangle and two equal squares have been inscribed in the upper triangle. Find the area of one of those squares

1

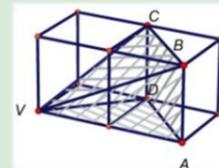
Through the intersection points of the line $r \equiv \begin{cases} x = -5 + 3t \\ y = -11 + 5t \\ z = 9 - 4t \end{cases}$ and from the sphere of equation $E \equiv (x + 2)^2 + (y - 1)^2 + (z + 5)^2 = 49$ planes tangent to the sphere have been drawn. Determine their equations.

2



3

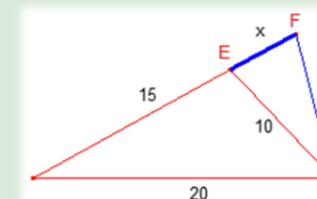
7



Let be two equal cubes joined by one face. Determine the ratio between the volume of the pyramid ABCDV and the sum of the volumes of the two cubes

8

In the figure, calculate the measure of segment EF



9

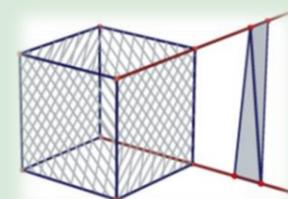
In a regular hexagon ABCDEF another regular hexagon GHIJKL is inscribed such that:

$$\overline{AG} = \frac{1}{3} \overline{AB}$$

Calculate the ratio between the areas of the hexagons

10

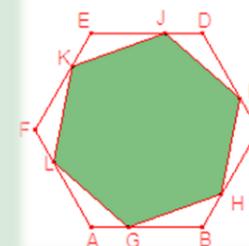
14



15

Two intersecting edges of a cube are extended. In each extension segments of length 1 are taken. Where must these segments be located so that the volume of the tetrahedron formed by the four ends of the segments is maximum?

16



17

21

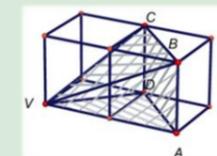
Let the sphere be given:

$$x^2 + y^2 + z^2 + 6y - 4z + 9 = 0$$

Calculate the equation of the sphere concentric with it that is tangent to the plane:

$$2x - 3y + 2z + 4 = 0$$

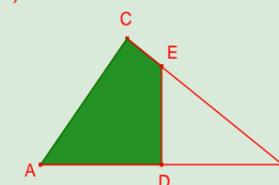
22



Let be two equal cubes joined by one face. Find the total area of the pyramid ABCDV

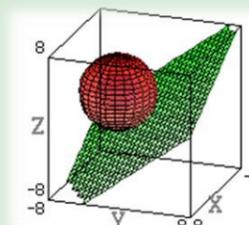
23

$\triangle ABC$ is a right triangle in C. D is the midpoint of AB and $DE \perp AB$. If $AC = 12$ and $AB = 20$ calculate the area of ADEC



24

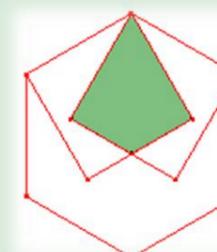
28



29

On two consecutive sides of a regular hexagon, two squares have been drawn towards the inside. Determine the ratio between the area of the common area of the two squares and the area of the initial hexagon

30



31