

## RAM - Maths Circle

Date: February 01, 2026  
Krea University, TTK Road

Some problems taken from AMC papers.

### 1. Problem 1

Consider the sequence of positive integers

1, 2, 1, 2, 3, 2, 1, 2, 3, 4, 3, 2, 1, 2, 3, 4, 5, 4, 3, 2, 1, 2, 3, 4, 5, 6, 5, 4, 3, 2, 1, 2...

What is the 2025th term in the sequence?

### 2. Problem 2

In an equilateral triangle each interior angle is trisected by a pair of rays. The intersection of the interiors of the middle  $20^\circ$ -angle at each vertex is the interior of a convex hexagon. What is the degree measure of the smallest angle of this hexagon?

**Hint:** First draw it as a diagram.

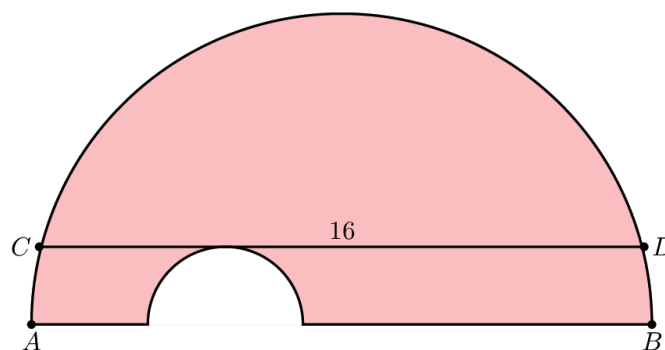
### 3. Problem 3

A silo (right circular cylinder) with diameter 20 meters stands in a field. Malathy is located 20 meters west and 15 meters south of the center of the silo. Abhinav is located 20 meters east and  $g > 0$  meters south of the center of the silo. The line of sight between Malathy and Abhinav is tangent to the silo. Find the value of  $g$ .

**Hint:** First draw it as a diagram.

### 4. Problem 4

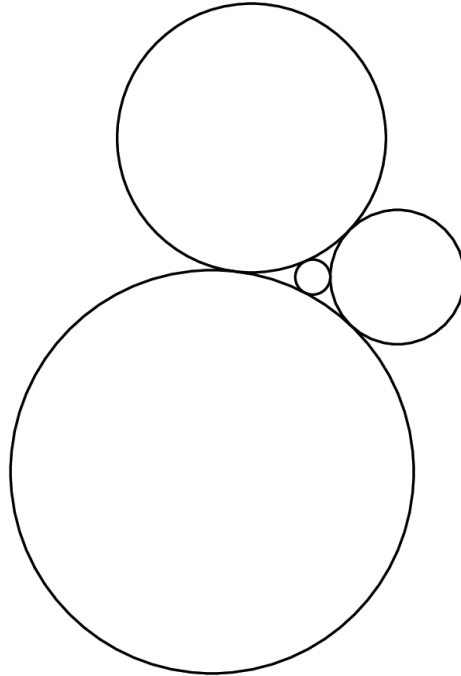
A semicircle has diameter  $\overline{AB}$  and chord  $\overline{CD}$  of length 16 parallel to  $\overline{AB}$ . A smaller semicircle with diameter on  $\overline{AB}$  and tangent to  $\overline{CD}$  is cut from the larger semicircle, as shown below.



What is the area of the resulting figure, shown shaded?

## 5. Problem 5

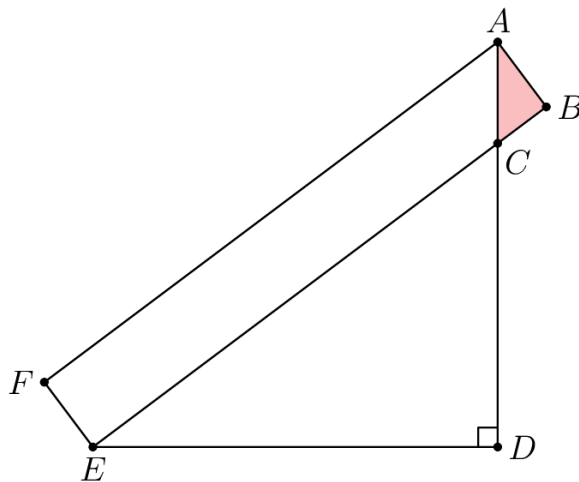
A circle of radius  $r$  is surrounded by three circles, whose radii are 1, 2, and 3, all externally tangent to the inner circle and externally tangent to each other, as shown in the diagram below.



What is  $r$ ?

## 6. Problem 6

In the figure below,  $ABEF$  is a rectangle,  $\overline{AD} \perp \overline{DE}$ ,  $AF = 7$ ,  $AB = 1$ , and  $AD = 5$ .



What is the area of  $\triangle ABC$ ?

## 7. Post-session notes

We revisited the earlier session on complex numbers and related it to geometrical properties. This has the advantage of introducing some calculative aspects of geometry without having to full on introduce trigonometry, which most of the kids haven't seen yet.

These are from AMC10 2025, so they're expected to be challenging for the kids though I felt some of these problems should be easy even at 8 level. So it wasn't a surprise when some of the kids were able to tackle some of them.

