

PYTHAGORAS QUEST

Distrikt Final



Handelskammaren
I sydsvenska företags intresse

Part 1. Time: **60 min – 7 problems**

Max points: **21** (3p/question).

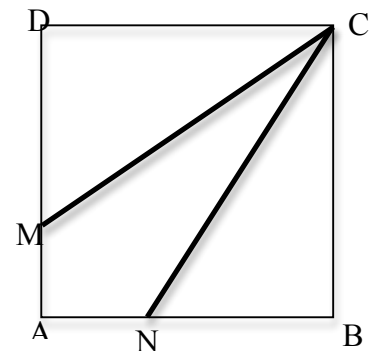
Allowed tools: Paper, pencil and rubber (no calculators).

Use a separate sheet of paper per problem. Write your team name on each sheet.

Full working is required for part 1!

1. Distance

A square ABCD with sides 3 cm is divided by the lines CM and CN into three equally sized parts. How long is CM?



2 Average

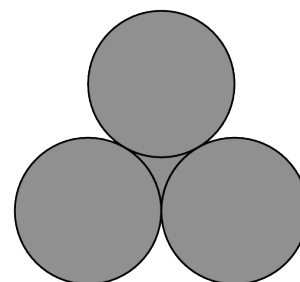
The mean of a set of five different positive integers is 15. The median is 18. What is the maximum possible value of the largest of these five integers?

3. Excel

Ulf gave an exam in a mathematics class of five students. He entered the scores in random order into a spreadsheet, which recalculated the class average after each score was entered. Ulf noticed that after each score was entered, the average was always an integer. The scores (listed in ascending order) were 71, 76, 80, 82, and 91. What was the last score he entered?

4. Circles

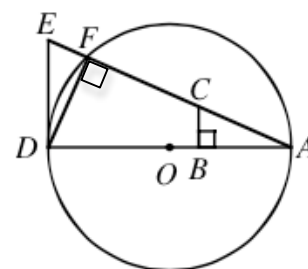
Three circles with radius 2 cm are mutually tangent (they just touch). What is the total area of the circles and the region bounded by them, as shown in the figure?

**5. Childsplay**

Three children are playing in the park. Inez and Elsa are standing on the exact same spot and Nils is standing 10 m away from them. Elsa moves 10 m from Inez in an arbitrary direction. What is the probability that Elsa is standing closer (or equally close to) Nils than Inez after Inez made her move?

6. Geometry

In the diagram shown, angle ABC is a right-angle and CB is parallel to ED . Also, angle EFD is 90° , $AB = DF$, $AD = 24$, $AE = 25$ and O is the centre of the circle. Determine the perimeter of $CDBF$.

**7. Murarna**

Bricklayer Anna would take nine hours to build a chimney alone, and bricklayer Erik would take 10 hours to build it alone. When they work together, they talk a lot, and their combined output decreases by 10 bricks per hour. Working together, they build the chimney in 5 hours. How many bricks are in the chimney?