Mathematics

Delprov C

1c

Elevens namn och klass/grupp

Skolverket

Instructions – part C

Time for the test

60 minutes for part C.

Aids

The allowed aids on part C are a formula sheet and a ruler.

Tasks

For the tasks in this part, you are required to show your solutions.
Write your solutions in the test booklet.

If only the answer needs to be given in a task, this will be indicated by *"Only answer required"*. For these tasks, no solutions need to be shown.

The maximum number of points you can be given for your answer is shown after each task.

Grading limits

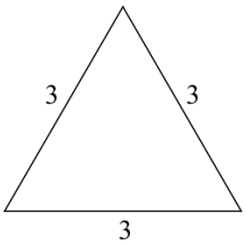
The test (parts B–D) gives a total maximum of 70 points.

Limit for test grade

E: At least 14 points.
D: At least 27 points, of which at least 12 points on level C or higher.
C: At least 35 points, of which at least 18 points on level C or higher.
B: At least 46 points, of which at least 6 points at level A.
A: At least 55 points, of which at least 11 points at level A.

Illustrations: Jens Ahlbom

17. To construct a pattern similar to snowflakes, one can do what the Swedish mathematician Helge von Koch did. (3/2/4)
Start from an equilateral triangle with 3 sides, see picture.



original triangle

Divide each side of the original triangle into three distances with equal lengths.
The middle distance now forms the side of a new equilateral triangle.
A new figure with a larger perimeter has now been formed, Figure 1.
Repeat the procedure to create the next figure, Figure 2.

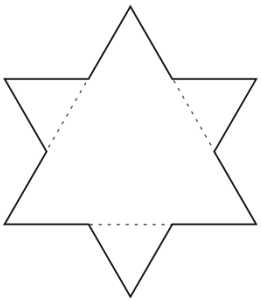


Figure 1

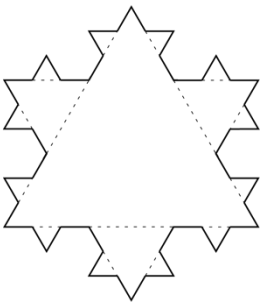


Figure 2

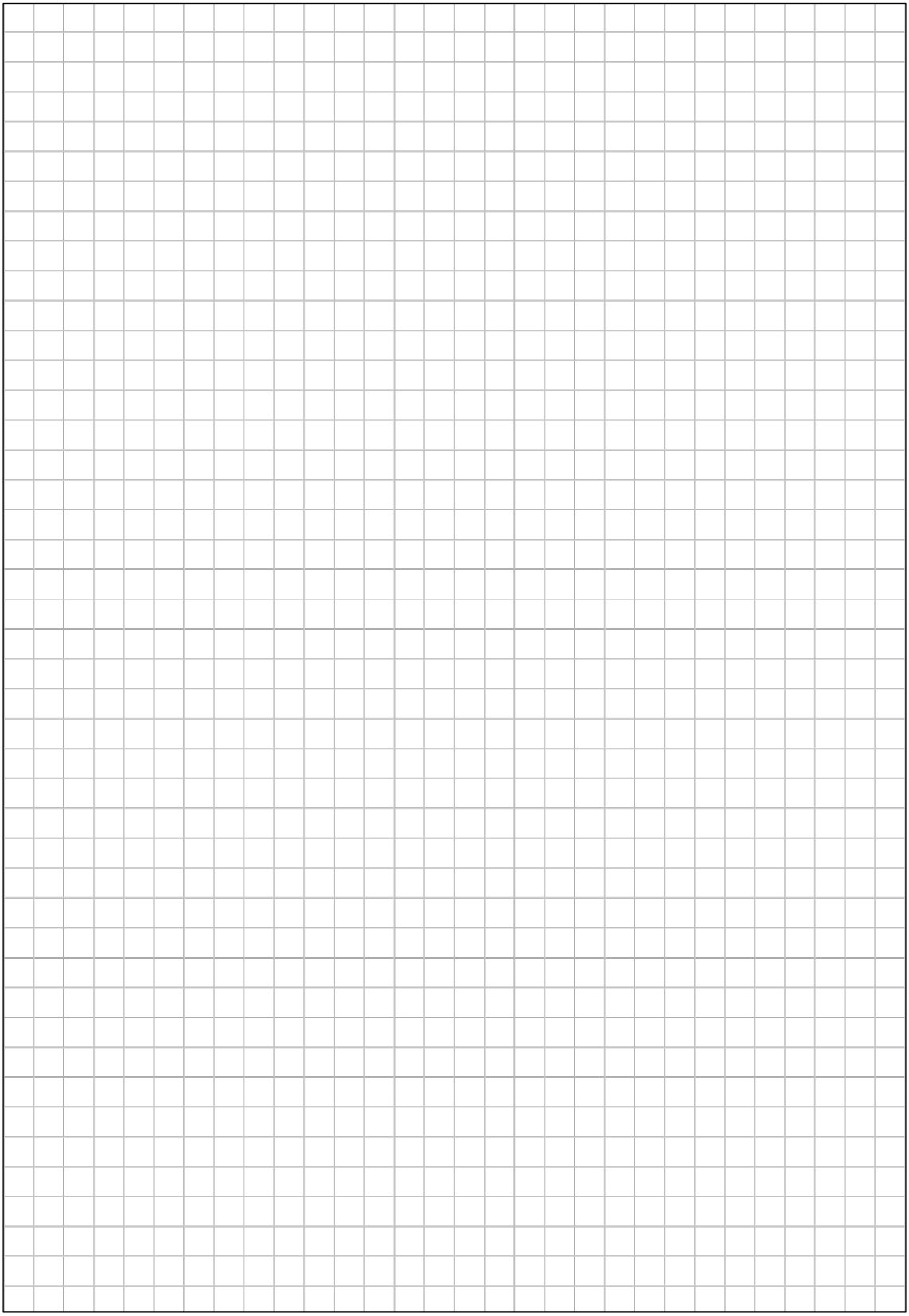
a) The original triangle has a perimeter of 9.
Calculate the perimeter of Figure 1.

b) Calculate the perimeter of Figure 2.

c) The perimeter increases with each figure.
Calculate the change factor from Figure 1 to Figure 2.

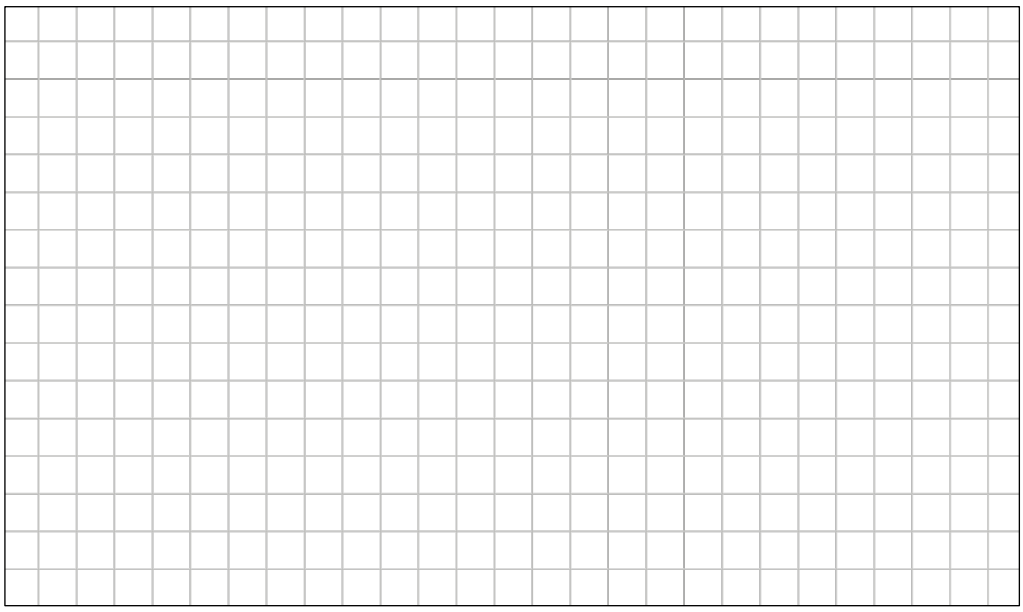
d) The perimeter increases exponentially with each figure.
Write an exact formula for the perimeter O for Figure n.

e) What is the number of the figure that has the perimeter $\frac{2^{16}}{3^6}$?

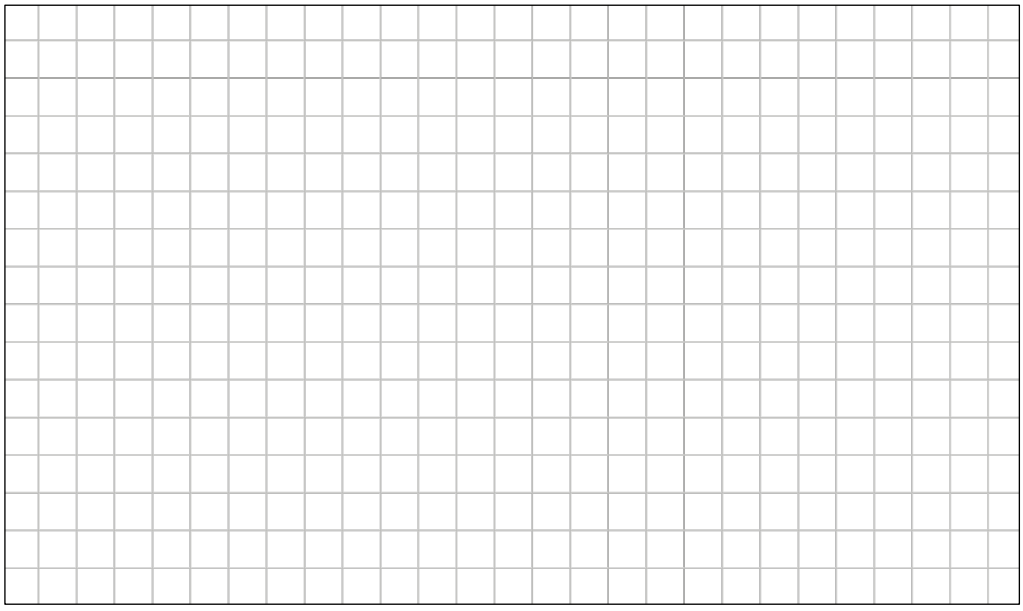


More tasks on the next page

18. Determine the equation of the straight line going through the points (2, 10) and (12, 30). (2/0/0)



19. Start from the expression $3(x + 4) - (8 + x)$
Determine x so that the value of the expression is 3. (1/1/0)



20. Solve the equation $(2x - 5)(x + 3) = 2x^2 - 9$ (0/2/0)

21. Ali attends the Natural Resource Use Programme and wants to mark off a 20 m² area to grow vegetables on. The area should have the shape of a triangle with the base b metres and the height h metres.
Ali wants to consider what the area might look like.

a) Determine a function for how base b depends on height h for Ali's area. (0/1/0)

b) Determine the domain of the function if b must be at least 1 m long. (0/1/1)

PRIM gruppen