

SUBJECT TEST

Mathematics

GRADE

9

This test will be re-used and is therefore protected by **Chapter 17** paragraph 4 of the **Official Secrets Act (2009:400)**. The intention is for this test to be re-used until **2018-06-30**. This should be considered when determining the applicability of the Official Secrets Act.

Spring 2012

Part A – oral part

Teacher material – for copying

Student material – for copying

Name

Teacher material – for copying

Implementation

Implementation should be carried out in a similar way for all the versions. In the oral part the pupils will work on 3 different tasks. In task 1 and task 2 the pupils are to answer individually while task 3 is a discussion question. The plane geometrical figures are distributed over the three different versions. In all three versions the pupils have the opportunity of demonstrating abilities at all grade levels. We recommend using all three versions within a class/school to reduce risk for disclosing or spreading the contents. Within each version the figures are positioned so that the first pair is the easiest to describe and in pair three there is opportunity for using Pythagoras' theorem to determine the exact perimeter in whole cm.

When the group has assembled you can hand out the word list and the chosen test version to all the pupils in the group. Point out for the pupils that they may not use rulers but that the small square is one square centimetre. Then distribute the figures so that each pupil is responsible for a pair of figures. Tell the pupils that they are to describe both of their figures. In their description they are to use words from the word list. Let the pupils study the word list and the figures for a few minutes.

Start with task 1 and decide which pupil should present his/her report first. The first pupil is allowed to finish his/her presentation and then the other pupils may add comments if they wish to. Continue with the next pupil and so on. Until all pupils have reported on task 1. At least one pair of figures will be left over and you can use these figures for further discussion if time allows. Then go on with another round dealing with task 2, first allowing the pupils to make individual presentations and then engaging them in a discussion together. Task 3 contains only common discussion questions.

Tasks for pupils

Task 1

Questions for individual pupils

- Which figures do you have?
- Describe them as clearly as you can and try to use words from the word list.

Leading questions if pupils by themselves do not get going or do not understand the task

Can you say something about the sides, the vertices, the angles? What would you call this figure? How do you know that?

Task 2

When all pupils in the group have presented their descriptions for task 1 they can be asked to compare the areas of their figures. Here too they can have a few minutes to think about it first by themselves.

Questions for individual pupils

- Which of your figures has the greatest area? How do you know this?

Discussion questions for the area task

- How can you determine the area of the figures? Can you do this in different ways? How?

Task 3

Turn to comparison of the perimeter of the figures. In version 1 you are to compare the figures in pair 1 and then the figures in pair 5. In version 2 you are to compare the figures in pair 4 and then the figures in pair 5. In version 3 you are to compare the figures in pair 1 and then the figures in pair 2.

Discussion questions about the perimeters of the figures

- Which of the figures has the greatest perimeter? How can you determine that?
- Is there any figure among all ten for which you can determine the perimeter exactly, expressed in whole cm? How can you do this? (If the group cannot present any answers ask them to look particularly at pair 3.)

Task specific assessment matrix

Assessment concerns	Qualitative levels			
	Lower			Higher
Understanding <i>To what extent does the pupil show understanding for the task and explain his/her conclusions.</i> <i>To what extent does the pupil use relationships and generalizations.</i>	<p>Describes at least one of the geometric figures and shows some understanding for the concept of area. E.g. by comparing and determining satisfactorily for some pair.</p> <p>Describes most of the properties of the figures.</p>		<p>Shows good understanding of the concept of perimeter and area e.g. by explaining how one can see that the area/perimeter is the same/different for the different figures.</p>	<p>Shows very good understanding for both the concepts perimeter and area e.g. by giving suggestions for different ways of determining areas of several figures <i>and/or</i> determines perimeter exactly for some figure using Pythagoras' theorem.</p>
	1/0	2/0	2/1	2/2 ☒
Language <i>How clear the pupil's solution account is.</i> <i>To what extent the pupil uses relevant mathematical language.</i>	<p>Chooses some words from the word list and uses them in an acceptable way in describing his/her figures. Comprehensible and possible to follow.</p>	1/0	<p>Chooses relevant words from the word list and uses them correctly in describing his/her figures. Easy to follow, using acceptable mathematical terminology.</p>	1/1 ☒
Participation <i>To what extent the pupil participates in discussions with mathematically based ideas.</i>	<p>Gives account only for his/her own figures.</p>	0/0	<p>Contributes own ideas and explanations when other pupils are giving their accounts or in the common discussions.</p>	1/1 ☒

<i>MVG-quality</i>	<i>is demonstrated in the oral part (2012) when the pupil</i>
Shows skill in problem solving and calculation.	shows skill in reasoning about or calculation of area and perimeter for many different kinds of plane geometrical figures
Formulates and develops problems, uses general strategies in problem solving.	
Interprets and analyses results, compares and evaluates the advantages and disadvantages of different methods.	
Uses mathematical reasoning, is involved in the arguments of others and promotes discussion.	presents arguments well for similarities and differences between two figures and shows high quality in mathematical reasoning both in his/her own account and when other pupils present theirs
Presents well-structured accounts using suitable/correct mathematical language.	presents well structured and clear accounts using consistently relevant mathematical terminology

Student material – for copying

Information for students about part A

This is a description of the oral part of the national test. Part A is carried out in groups consisting of 3–4 pupils that sit together with their teacher around a table.

- Each of you will get a paper with some geometrical figures. For a few minutes you can look at these and think about them. Your teacher will tell you in what order you should present your results.
- Each of you will make a presentation for the others in our group. After each presentation the other pupils can ask questions, make further comments and argue for or against what you said.
- When all have made their presentations the whole group will discuss some questions together.
- Your activity and contributions in this oral part will be assessed according to three aspects:

Understanding

To what extent you show understanding for the task, the concepts involved and the relationships between these.

Language

How clear your presentation is and how well you use mathematical language.

Participation

To what extent you participate in the discussion can argue for and defend your thoughts and ideas and make responses to the explanations of others.

Remember that you have the chance to show what you know in your own presentation, in the discussion after the presentations of the other pupils and in the common discussion at the end. Your efforts and performance on part A are combined to give a number of G- and VG-points. You may also demonstrate the MVG-qualities stated in the MVG-table (see earlier tests and assessment criteria and guidelines www.prim-gruppen.se). The result for the oral part is then combined together with the results on part B and part C.

Word list

Polygon

Hexagon

Pentagon

Quadrilateral

Rectangle

Square

Rhombus

Parallelogram

Parallel trapezium

Triangle

Regular

Side

Parallel

Opposite

Angle

Right angle

Acute angle

Obtuse angle

Isosceles

Equilateral

Right-angled

Vertically opposite angles

Diagonal

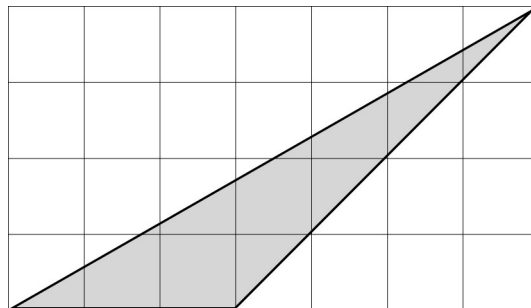
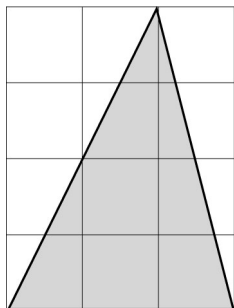
Line of Symmetry

Version 1

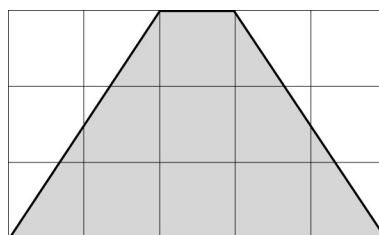
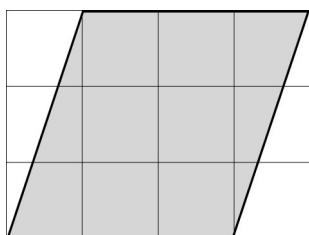


1 cm²

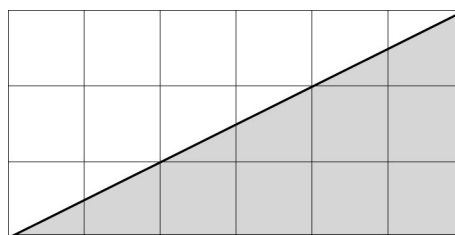
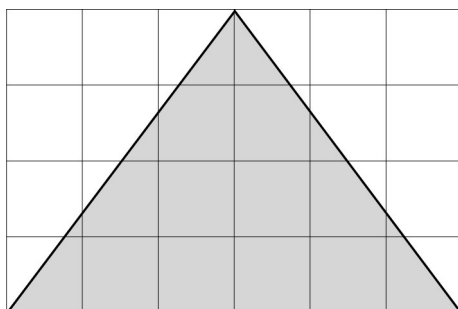
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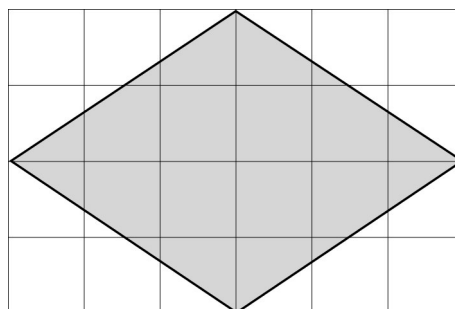
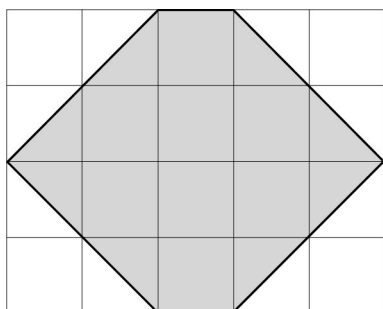
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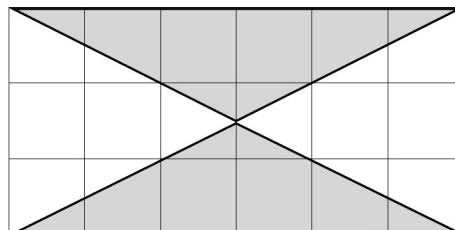
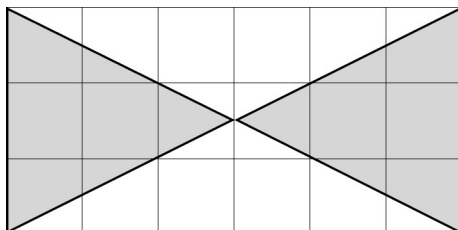
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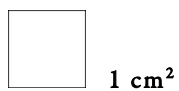
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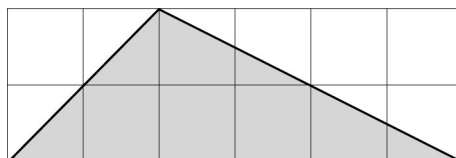
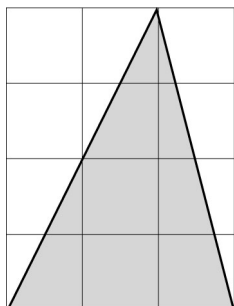
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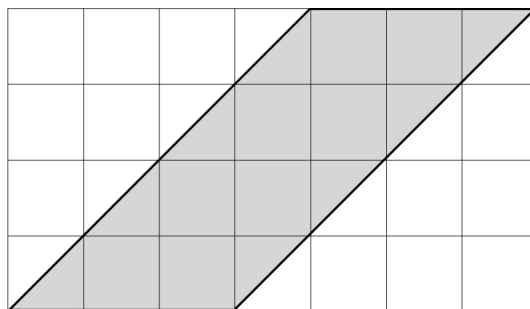
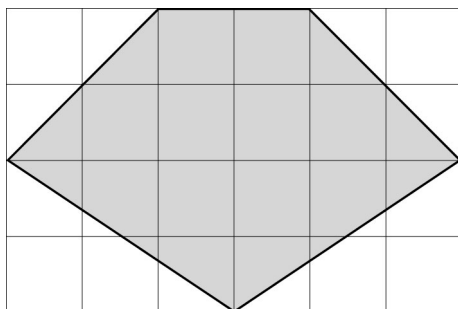
Version 2



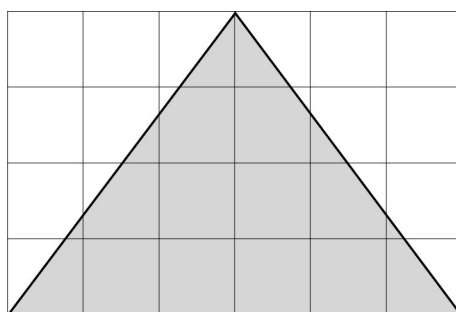
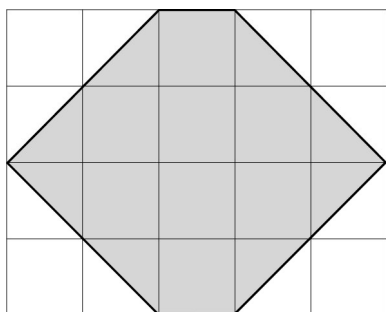
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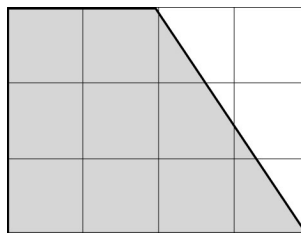
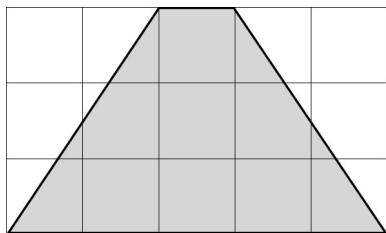
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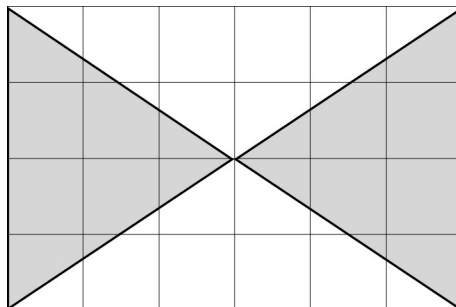
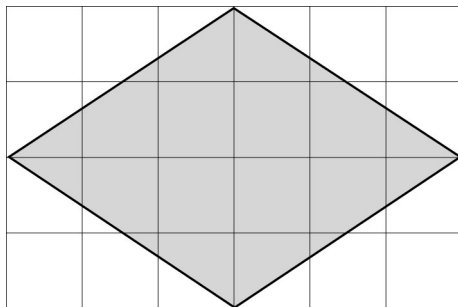
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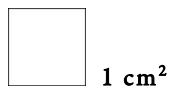
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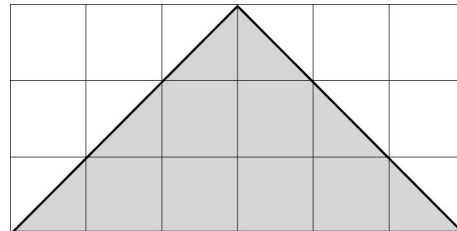
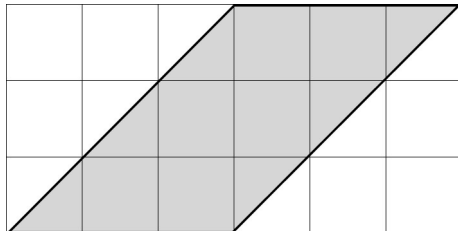
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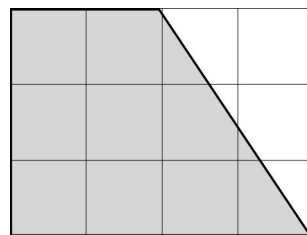
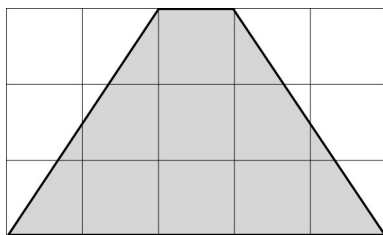
Version 3



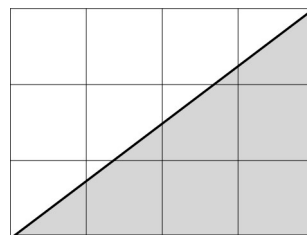
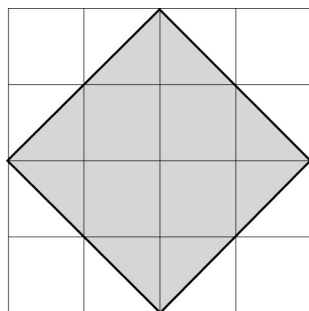
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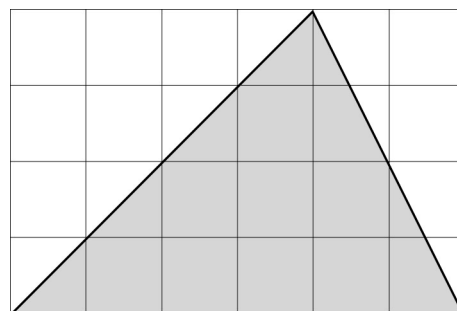
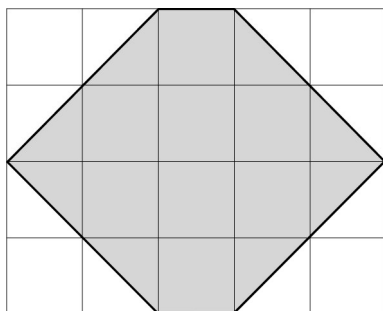
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Pair no. 3



Pair no. 4



Pair no. 5

