High School Mathematics Test 2013

Year 7

2D and 3D Shapes

Non Calculator Section

Skills and Knowledge Assessed:

- Name and list properties of common two dimensional shapes.
- Connect three-dimensional objects with their nets and other two-dimensional representations (ACMMG111)
- Construct simple prisms and pyramids (ACMMG140)
- Classify triangles according to their side and angle properties and describe quadrilaterals (ACMMG165)

Name_____

Answer all questions in the spaces provided on this test paper by:

Writing the answer in the box provided.

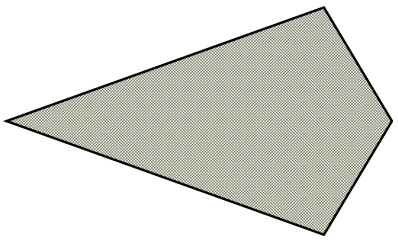
or

Shading in the bubble for the correct answer from the four choices provided.

Show any working out on the test paper.

You will need a ruler.

1. The quadrilateral shown is a :



Kite ☐ Parallelogram ☐ Rhombus ☐ Square ☐

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2. What order of rotational symmetry does a rectangle have?

2 ☐ 1 ☐ 4 ☐ 8 ☐

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3. Use a ruler to draw a neat sketch of a parallelogram, showing any equal angles.

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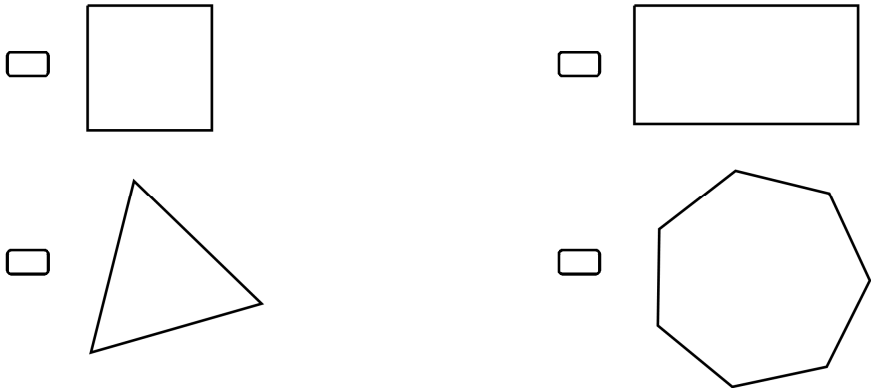
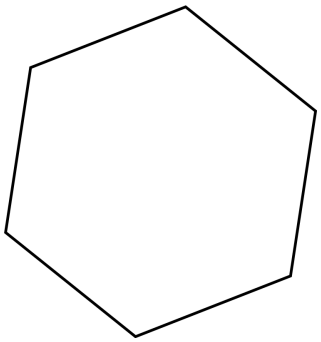
4. Which shape below is an irregular polygon?



5. Draw in all the diagonals on the hexagon shown and complete the statement about the diagonals.

A hexagon has ☐ diagonals.

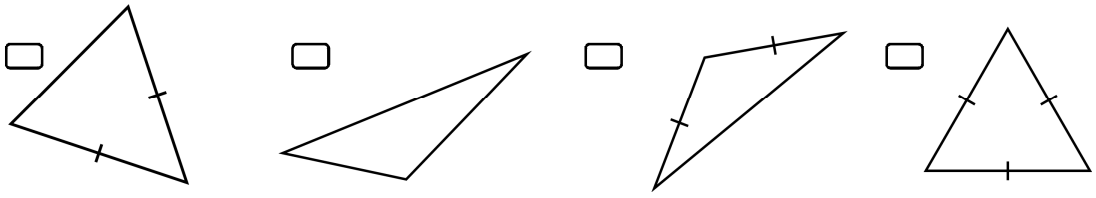


6. Which shape has the same number of axes of symmetry as its order of rotational symmetry?

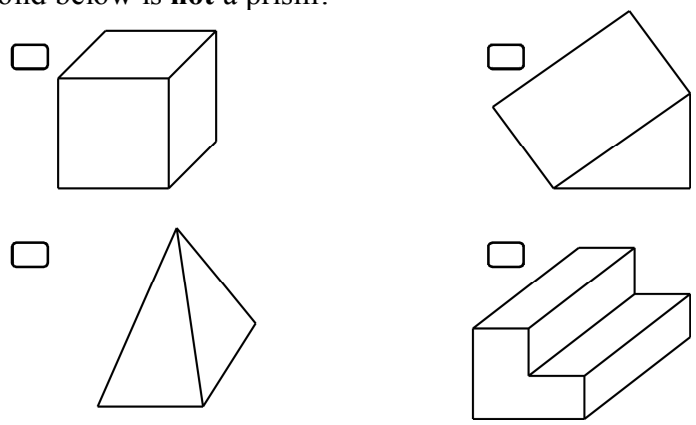
7. Which statement is true for an equilateral triangle but not of an isosceles triangle?

- ☐ It has at least one axis of line symmetry.
- ☐ There are at least two equal angles.
- ☐ There are at least two equal sides.
- ☐ It has point symmetry.

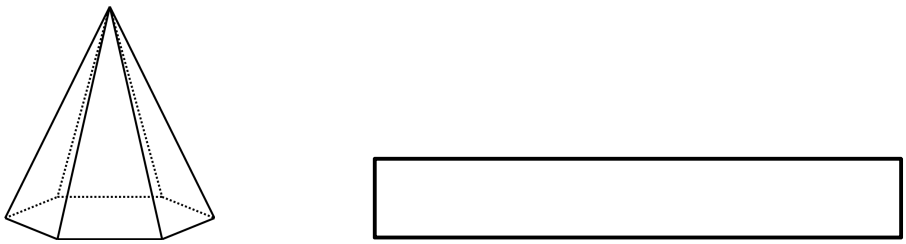
8. Which diagram shows an obtuse scalene triangle?



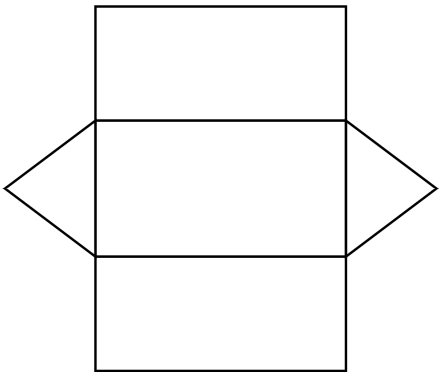
9. Which solid below is **not** a prism?



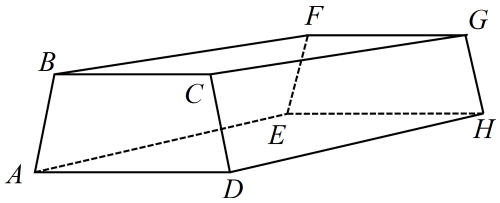
10. What is the name of the solid shown below?



11. Draw a 3D sketch of the solid whose net is shown.

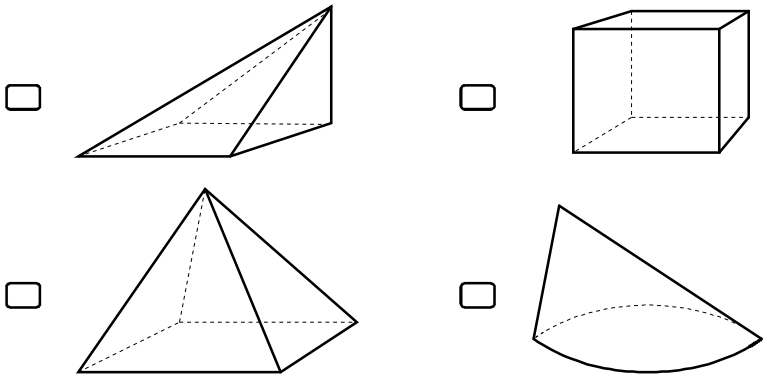


12. Which statement is true about the trapezoidal prism shown?

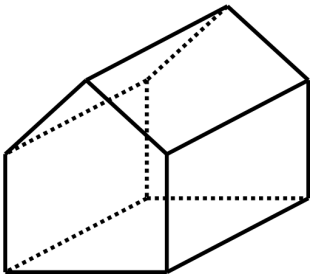


- ☐ *AB* is parallel to *EF* and *AB* is skew to *AD*.
- ☐ *AB* is parallel to *CD* and *AB* is skew to *GH*.
- ☐ *AB* is parallel to *FE* and *AB* is skew to *GH*.
- ☐ *AB* is parallel to *CD* and *AB* is skew to *AD*.

13. Which shape below is a right pyramid?



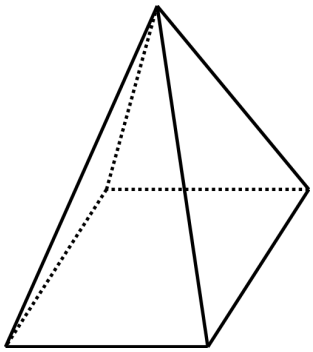
14. How many vertices and faces does the solid shown below have?



vertices

faces

15. Use a ruler to draw the net of the solid shown.



High School Mathematics Test 2013

Year 7

2D and 3D Shapes

Calculator Allowed Short Answer Section

Name_____

Answer all questions in the spaces provided on this test paper by:
Writing the answer in the box provided.
or
Shading in the bubble for the correct answer from the four choices provided.
Show any working out on the test paper. Calculators are allowed.

1. A quadrilateral which has four equal sides and two pairs of opposite equal angles is called a:

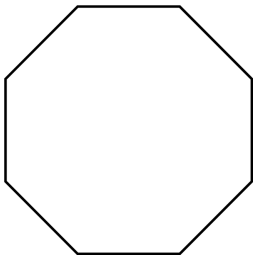
   ☐ Kite ☐ Parallelogram ☐ Rhombus ☐ Square

2. Which is not true of a square?

   ☐ All four sides are equal ☐ All angles are right angles.

   ☐ Four axes of line symmetry. ☐ Rotational symmetry of order 2.

3. Which is an accurate description of the shape shown below?

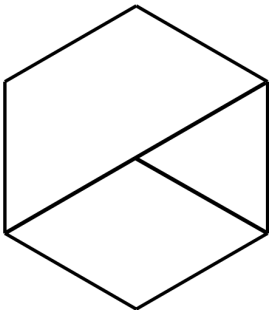
   ☐ A regular hexagon.
   ☐ An irregular hexagon.
   ☐ An irregular octagon.
   ☐ A regular octagon.

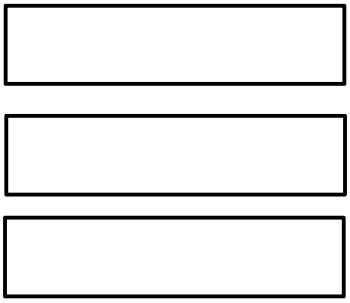
4. Use a ruler to sketch an irregular hexagon.

5. Which shape below has no axes of line symmetry but has rotational symmetry of order 2?

   ☐ Rhombus ☐ Kite ☐ Parallelogram ☐ Trapezium

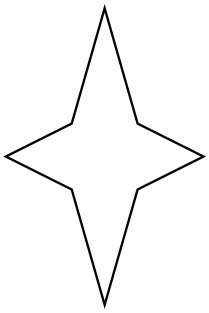
6. A regular hexagon is cut along the one diagonal and then half way along another diagonal as shown.
Name the three shapes which are formed as a result.





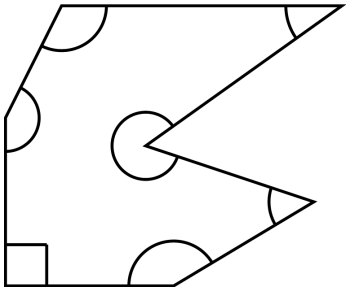
7. The shape shown has :

- ☐ Two axes of line symmetry and point symmetry.
- ☐ Two axes of line symmetry and no point symmetry.
- ☐ Four axes of line symmetry and point symmetry.
- ☐ Four axes of line symmetry and no point symmetry.

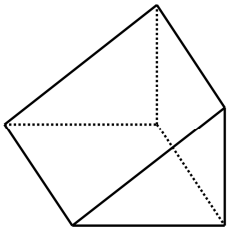


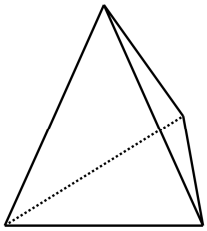
8. How many of the interior angles in the polygon below are acute angles?

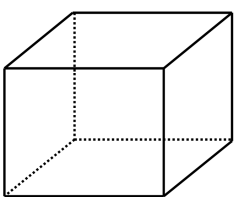
There are ☐ acute angles.

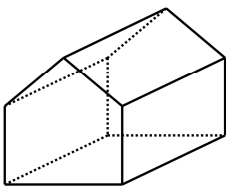


9. Which of the solids shown has exactly two triangular faces and three rectangular faces?

☐ 

☐ 

☐ 

☐ 

10. How many triangular and pentagonal faces does a pentagonal pyramid have?

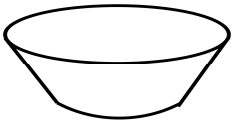
Triangular faces : ☐

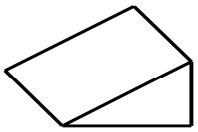
Pentagonal faces : ☐

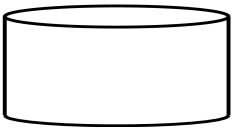
11. How many faces and edges are there on a rectangular pyramid?

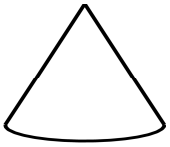
It has ☐ faces and ☐ edges.

12. Which solid below is a polyhedron?

☐ 

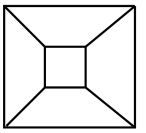
☐ 

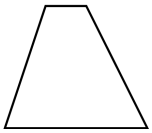
☐ 

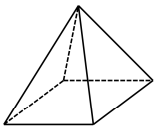
☐ 

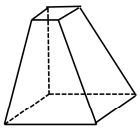
13. Which of the solids shown would have the top and side view below?

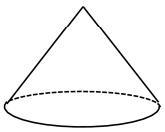
Top View *Side View*

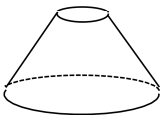




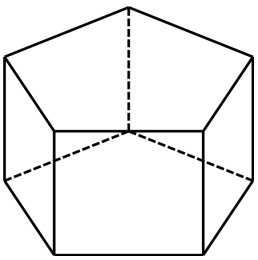
☐ 

☐ 

☐ 

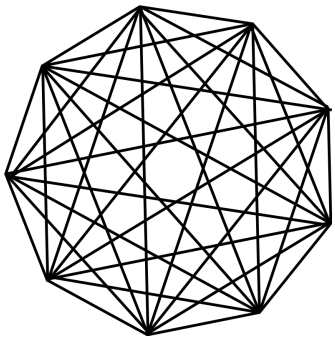
☐ 

14. Complete the table to illustrate Euler's Rule for a Pentagonal Prism.



A Pentagonal Prism	
Faces (F)	
Vertices (V)	
Edges (E)	
F + V – E	

15. All the diagonals of the nonagon have been drawn.
Complete the statement about the diagonals.



A nonagon has ☐ diagonals.

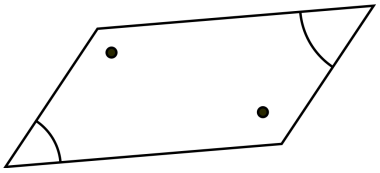
High School Mathematics Test 2013

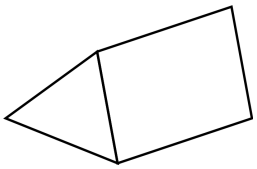
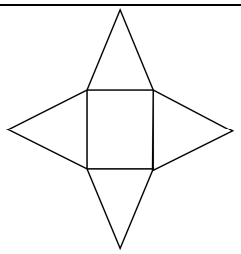
Year 7

2D and 3D Shapes

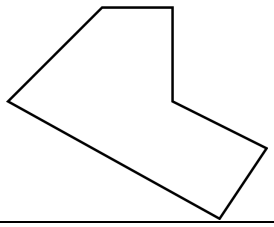
ANSWERS

Non Calculator Section

1.	Kite
2.	2
3.	
4.	The 2nd one. (Rectangle)
5.	9
6.	The last one (3 lines and order 3)
7.	It has point symmetry.
8.	The 2nd one.
9.	The 3rd one. (Pyramid)
10.	Hexagonal Pyramid

11.	
12.	*AB* is parallel to *FE* and *AB* is skew to *GH*. (3rd Answer)
13.	The 3rd one
14.	10 vertices 7 faces
15.	

Calculator Allowed Section

1.	Rhombus
2.	Rotational symmetry of order 2.
3.	A regular octagon
4.	Any irregular hexagon. e.g. 
5.	Parallelogram
6.	Trapezium, Rhombus and Equilateral Triangle
7.	Two axes of line symmetry and point symmetry. (1st answer)
8.	2

9.	The 1st one.
10.	5 triangular 1 pentagonal
11.	5 faces and 8 edges.
12.	The 2nd one. (Triangular Prism)
13.	The 2nd one.
14.	Faces (F) 7 Vertices(V) 10 Edges (E) 15 F + V - E 2
15.	27