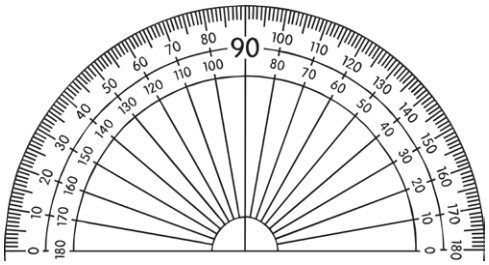
Name:

Maths Assessment Year 6: Geometry - Properties of Shapes

You will need a protractor (angle measurer) and ruler for this task.



1. Draw 2D shapes using given dimensions and angles.
2. Recognise, describe and build simple 3D shapes, including making nets.
3. Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.
4. Illustrate and name parts of circles and know the relationship between diameter and radius.
5. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

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Name: Date:

/40 total

Maths Assessment Year 6: Geometry - Properties of Shapes

1. Draw 2D shapes using given dimensions and angles.

a) Draw a regular pentagon, where each edge measures 3cm and each internal angle measures 108°.

1 mark

b) Draw a right-angled triangle with a horizontal edge that measures 4cm and a vertical edge that measures 5cm.

1 mark

c) Draw a parallelogram, where each edge measures 4cm, two internal angles each measure 100° and two internal angles each measure 80°.

1 mark

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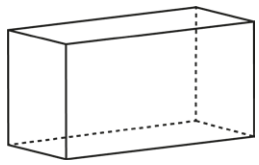
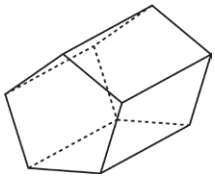
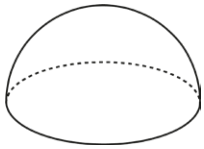
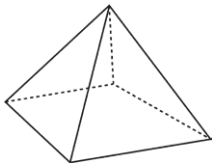
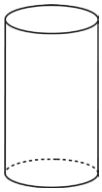
2. Recognise, describe and build simple 3D shapes, including making nets.

a) Name these shapes:

5 marks

b) Describe the properties of these 3D shapes:

	number of curved surfaces	number of flat faces	number of edges	number of vertices
cube				
cuboid				
tetrahedron				
triangular prism				
square-based pyramid				

5 marks

Total for this page

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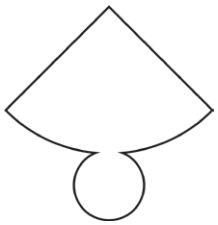
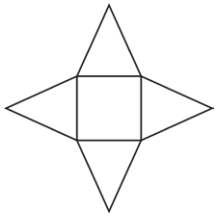
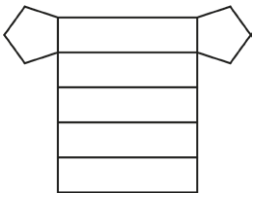
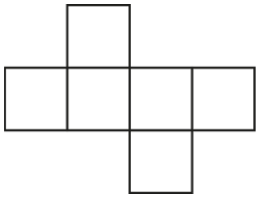
c) Name these shapes:

properties	name of shape
1 flat face, 1 curved surface, 1 edge, 1 vertex	
2 flat faces, 1 curved surface, 2 edges, 0 vertices	
0 flat faces, 1 curved surface, 0 edges, 0 vertices	

3 marks

d) Below are nets of 3D shapes. Write the name of the shape that can be made using each net:

4 marks

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e) Draw a cuboid net, where each rectangular face measures 3cm by 2cm:

1 mark

3. Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.

a) Write the names of these shapes in the correct places in this Carroll diagram:

square	rectangle	right-angled triangle	regular pentagon
equilateral triangle	regular octagon	semi-circle	parallelogram

	polygon	not a polygon
at least one right angle		
no right angles		

1 mark

Total for this page

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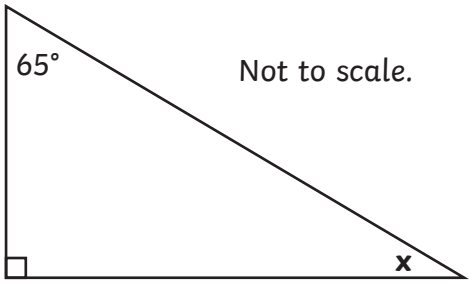
b) Calculate the internal angle labelled **x** in this right-angled triangle.

Show your working out.

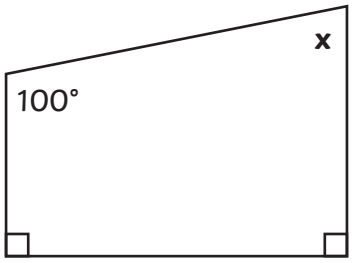


x = ... °

2 marks

c) Calculate the internal angle labelled **x** in this irregular quadrilateral.

Show your working out.



x = ... °

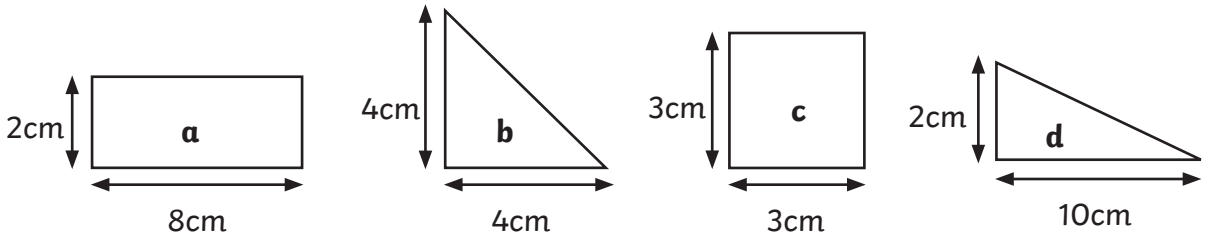
2 marks

d) The sum of the internal angles in a regular hexagon is 720°. Calculate the measurement of one internal angle in a regular hexagon.

Show your working out.

2 marks

e) Put these shapes in order based on their area, from smallest to largest, by writing their letters in the grid below:



smallest largest

1 mark

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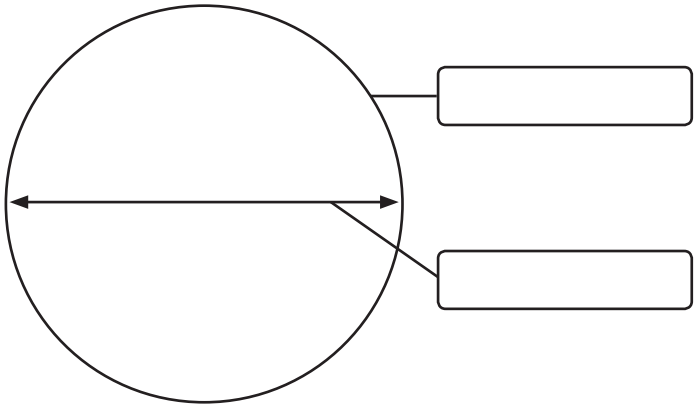
4. Illustrate and name parts of circles and know that the relationship between diameter and radius.

a) Label the parts of this circle:



1 mark

b) On the circle above, illustrate and label the radius.

1 mark

c) The radius of a circle is 5.2cm. Calculate its diameter. .....

1 mark

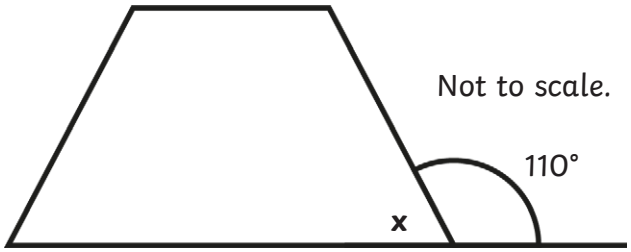
d) The diameter of a circle is 11cm. Calculate its radius. .....

1 mark

5. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

a) Calculate the internal angle labelled **x** in this shape using the information given.

Show your working out.



x = ... °

2 marks

Total for this page

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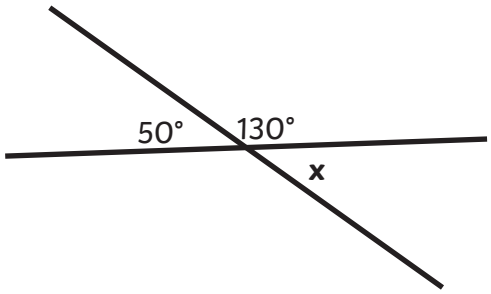
b) What is the measurement of the angle labelled **x**?



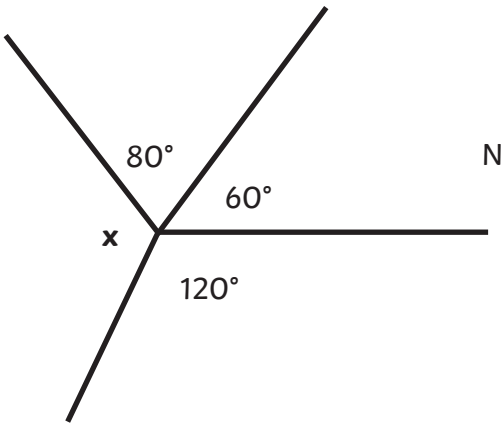
Not to scale.

x = ... °

1 mark

c) What is the measurement of the angle labelled **x**?

Show your working out.



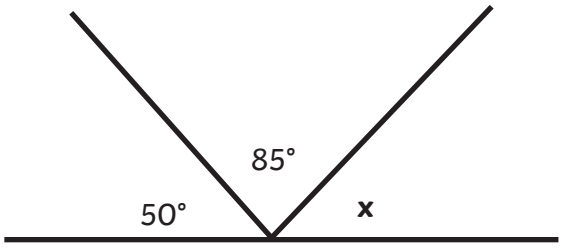
Not to scale.

x = ... °

2 marks

d) Calculate the missing angle.

Show your working out.



x = ... °

2 marks

Total for this page

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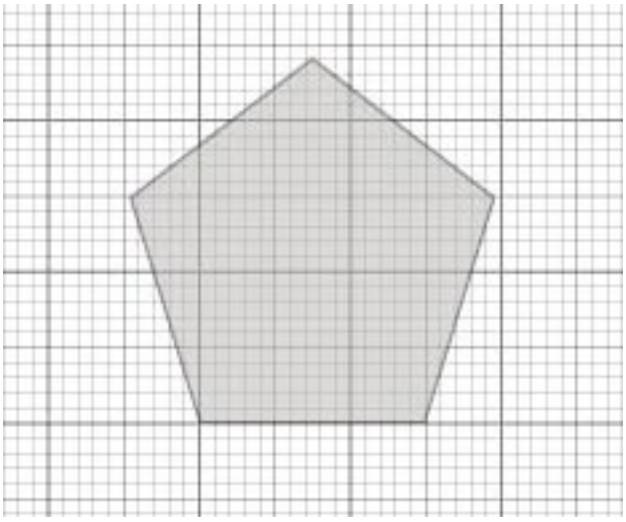
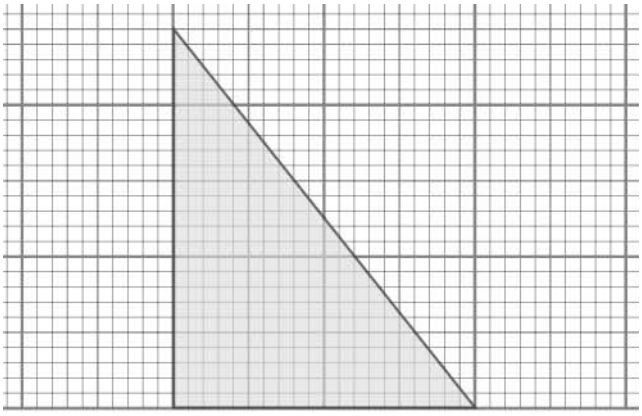
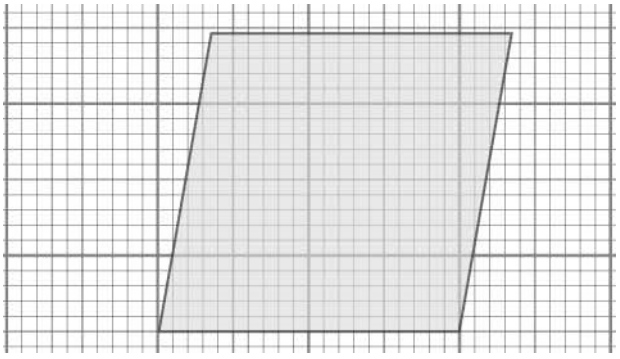
question	answer	marks	notes
1. Draw 2D shapes using given dimensions and angles.			
a		1	
b		1	
c		1	

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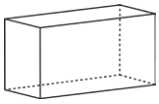
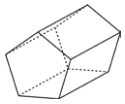
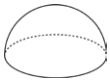
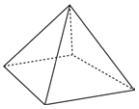
<table>
<tr><th>question</th><th>answer</th><th>marks</th><th>notes</th></tr>
<tr><td colspan="4">2. Recognise, describe and build simple 3D shapes, including making nets.</td></tr>
<tr><td>a</td><td>
<table>
<tr><td>  </td><td>cuboid</td></tr>
<tr><td>  </td><td>pentagonal prism</td></tr>
<tr><td>  </td><td>hemisphere</td></tr>
<tr><td>  </td><td>square based pyramid</td></tr>
<tr><td> </td><td>cylinder</td></tr>
</table>
</td><td>5</td><td>1 mark for each correct shape name. Accept incorrect spellings, where the intention is clear.</td></tr>
<tr><td>b</td><td>
<table>
<tr><th></th><th>Number of curved faces</th><th>Number of flat faces</th><th>Number of edges</th><th>Number of vertices</th></tr>
<tr><td>cube</td><td>0</td><td>6</td><td>12</td><td>8</td></tr>
<tr><td>cuboid</td><td>0</td><td>6</td><td>12</td><td>8</td></tr>
<tr><td>tetrahedron</td><td>0</td><td>4</td><td>6</td><td>4</td></tr>
<tr><td>triangular prism</td><td>0</td><td>5</td><td>9</td><td>6</td></tr>
<tr><td>square based pyramid</td><td>0</td><td>5</td><td>8</td><td>5</td></tr>
</table>
</td><td>5</td><td>One mark each shape that has all the properties correctly completed.</td></tr>
<tr><td>c</td><td>
<table>
<tr><td>Properties</td><td>Name of shape</td></tr>
<tr><td>1 flat face, 1 curved face, 1 edge, 1 vertex</td><td>cone</td></tr>
<tr><td>2 flat faces, 1 curved face, 2 edges, 0 vertices</td><td>cylinder</td></tr>
<tr><td>0 flat faces, 1 curved face, 0 edges, 0 vertices</td><td>sphere</td></tr>
</table>
</td><td>3</td><td>1 mark for each correct shape name. Accept incorrect spellings, where the intention is clear.</td></tr>
</table>

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<table>
<tr><th>question</th><th>answer</th><th>marks</th><th>notes</th></tr>
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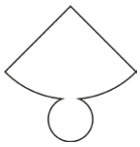
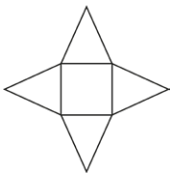
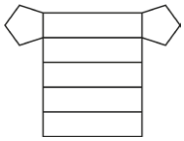
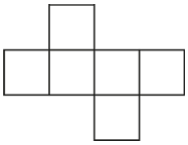
<tr><td>  </td><td>cone</td></tr>
<tr><td>  </td><td>square based pyramid</td></tr>
<tr><td>  </td><td>pentagonal prism</td></tr>
<tr><td>  </td><td>cube</td></tr>
</table></td><td>4</td><td>1 mark for each shape correctly identified.</td></tr>
<tr><td>e</td><td>1 marks for a plausible cuboid net drawn, which follows the specified measurements. Include nets drawn with or without ‘tabs’.</td><td>1</td><td></td></tr>
<tr><td colspan="4">3. Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.</td></tr>
<tr><td>a</td><td><table>
<tr><td></td><td>Polygon</td><td>Not a polygon</td></tr>
<tr><td>At least one right angle</td><td>square, rectangle, right angled triangle,</td><td></td></tr>
<tr><td>No right angles</td><td>regular pentagon, equilateral triangle, regular octagon, parallelogram</td><td>semi-circle</td></tr>
</table></td><td>1</td><td>1 mark for all shapes correctly positioned.</td></tr>
<tr><td>b</td><td>65 + 90 = 155
180 – 155 = 25
x = 25°</td><td>2</td><td rowspan="3">2 marks for correct answer.
1 mark for an appropriate calculation, but incorrect answer.</td></tr>
<tr><td>c</td><td>90 + 90 + 100 = 280
360 – 280 = 80
x = 80°</td><td>2</td></tr>
<tr><td>d</td><td>720 ÷ 6 = 120
120°</td><td>2</td></tr>
<tr><td>e</td><td><table>
<tr><td>b</td><td>c</td><td>d</td><td>a</td></tr>
<tr><td colspan="2">smallest</td><td colspan="2">largest</td></tr>
</table></td><td>1</td><td></td></tr>
</table>

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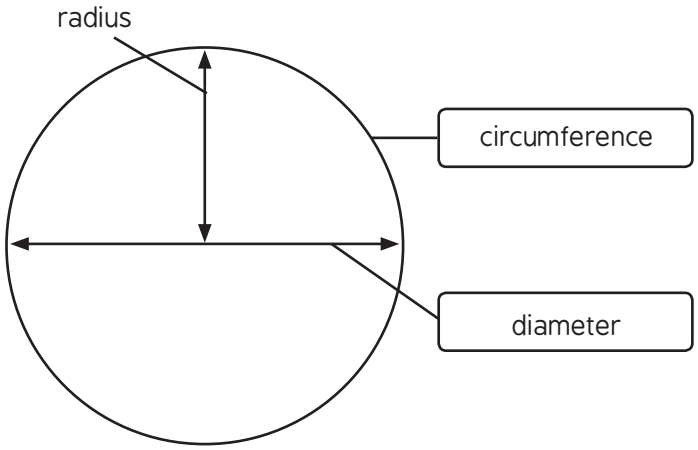
question	answer	marks	notes
4. Illustrate and name parts of circles and know that the relationship between diameter and radius.			
a		1	
b	Radius is illustrated and labelled appropriately.	1	
c	10.4cm	1	
d	5.5cm	1	
5. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.			
a	180 – 110 = 70 x = **70°**	2	2 marks for correct answer. 1 mark for an appropriate calculation, but incorrect answer.
b	x = **50°**	1	
c	80 + 60 + 120 = 260 360 – 260 = 100 x = **100°**	2	2 marks for correct answer. 1 mark for an appropriate calculation, but incorrect answer.
d	85 + 50 = 135 180 - 135 = 45 x = **45°**	2	
		Total 40	

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