

















Properties of Shapes: Measuring Obtuse Angles

<p>Aim Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Draw given angles, and measure them in degrees.</p> <p>DfE Ready-to-Progress Criteria Compare angles, estimate and measure angles in degrees and draw angles of a given size (5G-1).</p> <p>To measure obtuse angles in degrees.</p>	<p>Success Criteria I can read obtuse angles shown on a protractor. I can use a protractor to accurately measure angles greater than 90 degrees. I can read both the inside and outside scale of the protractor accurately.</p>	<p>Resources Lesson Pack Protractors</p>
	<p>Key/New Words Protractor, angle, turn, degrees, acute, right, clockwise, anticlockwise.</p>	<p>Preparation Differentiated Measuring Obtuse Angles Activity Sheets – one per child Diving into Mastery Activity Sheets – as required</p>

Prior Learning	It will be helpful if children can measure acute angles on a protractor. This is covered in Measuring Acute Angles
-----------------------	--

Learning Sequence

	<p>Remember It: Using the corresponding slide on the Lesson Presentation, the children use their reasoning skills to identify which of the five angles shown are obtuse. They are then challenged to draw three more obtuse angles on their whiteboard. Can the children identify that an angle greater than a right angle is obtuse?</p>	
	<p>The Protractor: Using the corresponding slides on the Lesson Presentation, the children rehearse using a protractor as a tool to measure obtuse angles in degrees. Visual animations are used to guide the children through the correct way to use the protractor, and emphasis is placed on how to use both the clockwise and anticlockwise scales. Can the children read obtuse angles shown on a protractor? Can the children read both the inside and outside scale of the protractor accurately?</p>	
	<p>Reasoning: Using the corresponding slides on the Lesson Presentation, the children answer three reasoning questions about reading obtuse angles on a protractor, applying their learning from the previous section. Can the children solve reasoning questions about reading obtuse angles on a protractor?</p>	
	<p>Measuring Angles in Degrees: The children complete the differentiated Measuring Obtuse Angles Activity Sheets.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>Children working towards expected level read and measure angles to five degrees.</p> </div> <div style="text-align: center;">  <p>Children working at expected level read and measure angles to one degree.</p> </div> <div style="text-align: center;">  <p>Children working at greater depth use a pencil and ruler to draw obtuse angles which they estimate first, then measure accurately using a protractor.</p> </div> </div>	
	<p>Diving into Mastery: Schools using a mastery approach may prefer to use the following as an alternative activity. These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.</p> <ul style="list-style-type: none">  Children complete fluency questions related to measuring obtuse angles in degrees.  Children answer reasoning questions related to measuring obtuse angles in degrees.  Children work either individually or collaboratively on problem-solving questions related to measuring obtuse angles in degrees 	

<p>Exploreit Learnit: Children will find this superb Knowledge Organiser helpful to support their understanding of measuring angles.</p>

DISCLAIMER

We hope you find the information on our website and resources useful.

Displaying the Presentation

To ensure this presentation displays correctly: If you are a Mac user, the presentation may open in 'slide master' mode - to see all the content, click 'close slide master' and the presentation should display correctly. If you are using Google Drive, the presentation won't display correctly if you open it in Google Slides. If you have opened it in Google Slides, you will need to download it again from the Twinkl website and this time open it from your computer.

Animations

This resource has been designed with animations to make it as fun and engaging as possible. To view the content in the correct formatting, please view the PowerPoint in 'slide show mode'. This takes you from desktop to presentation mode. If you view the slides out of 'slide show mode', you may find that some of the text and images overlap each other and/or are difficult to read.

To enter slide show mode, go to the **slide show menu tab** and select either **from beginning** or **from current slide**.

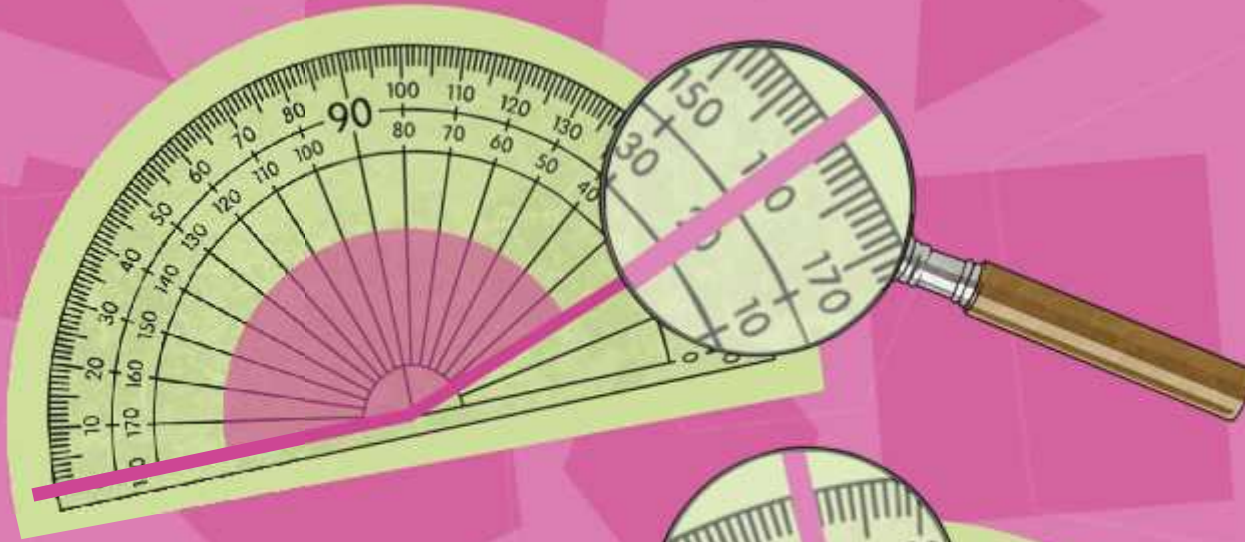
You may wish to delete this slide before beginning the presentation.



Maths

Properties of Shapes

Measuring Obtuse Angles



Aim

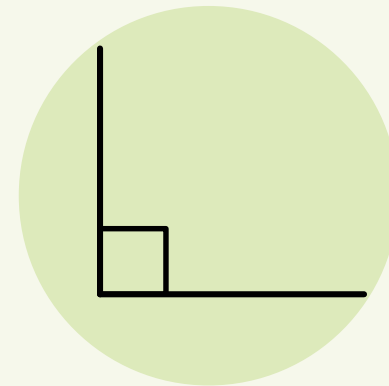
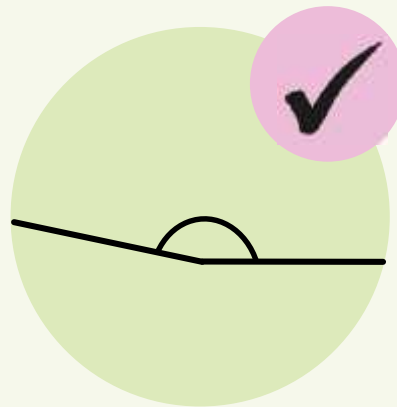
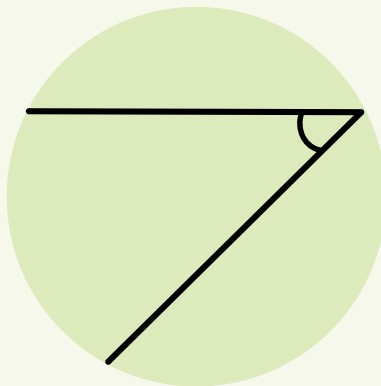
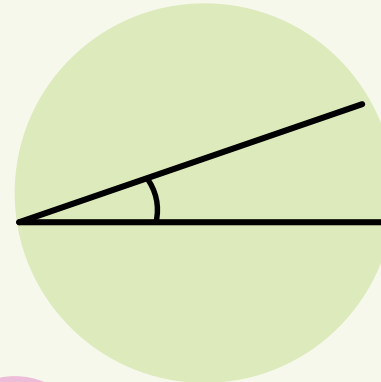
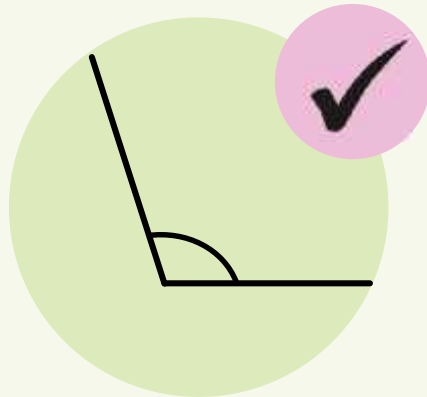
- To measure obtuse angles in degrees.

Success Criteria

- I can read obtuse angles shown on a protractor.
- I can use a protractor to accurately measure angles greater than 90 degrees.
- I can read both the inside and outside scale of the protractor accurately.

Remember It

Which of these angles are obtuse? Explain your reasoning.

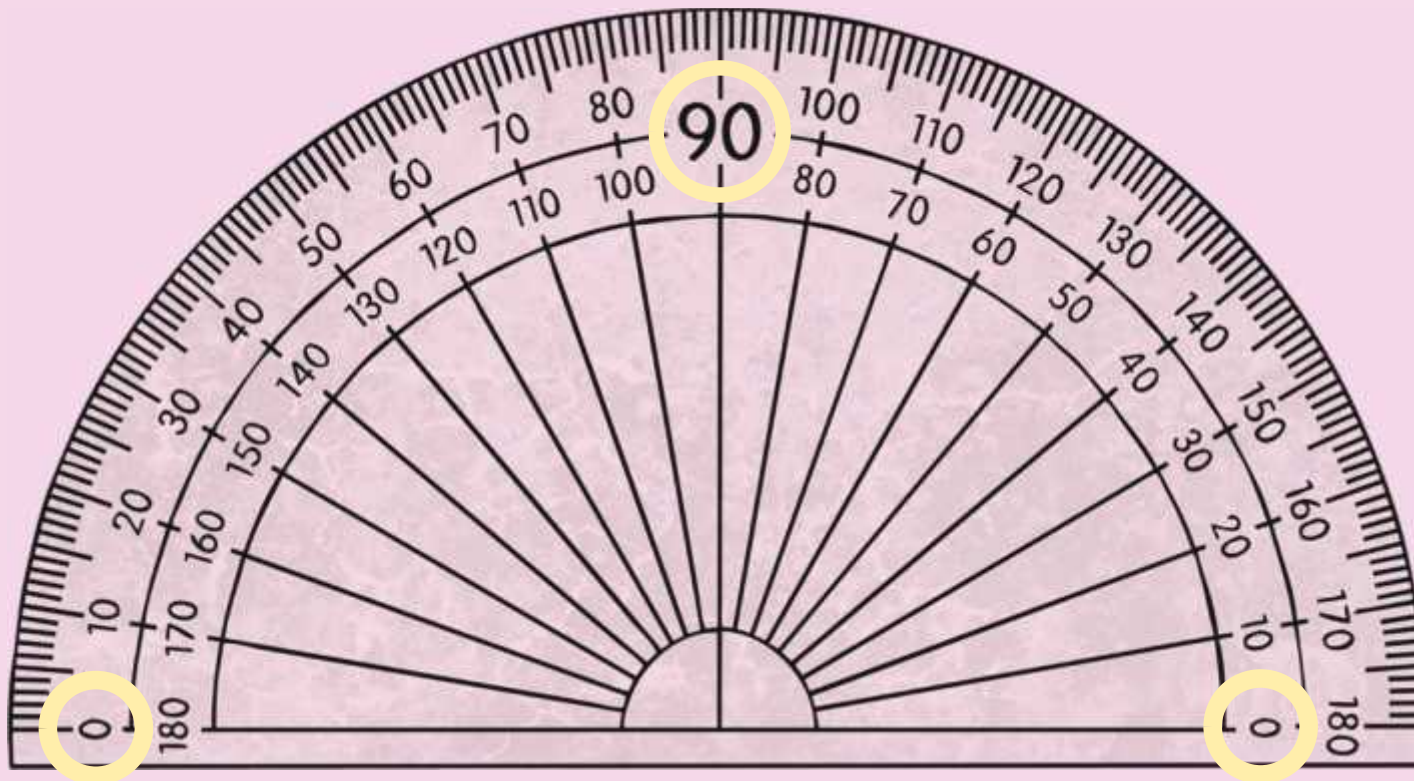


Can you draw three more obtuse angles on your whiteboard?

The Protractor

We can use a protractor (angle measurer) to measure obtuse angles.

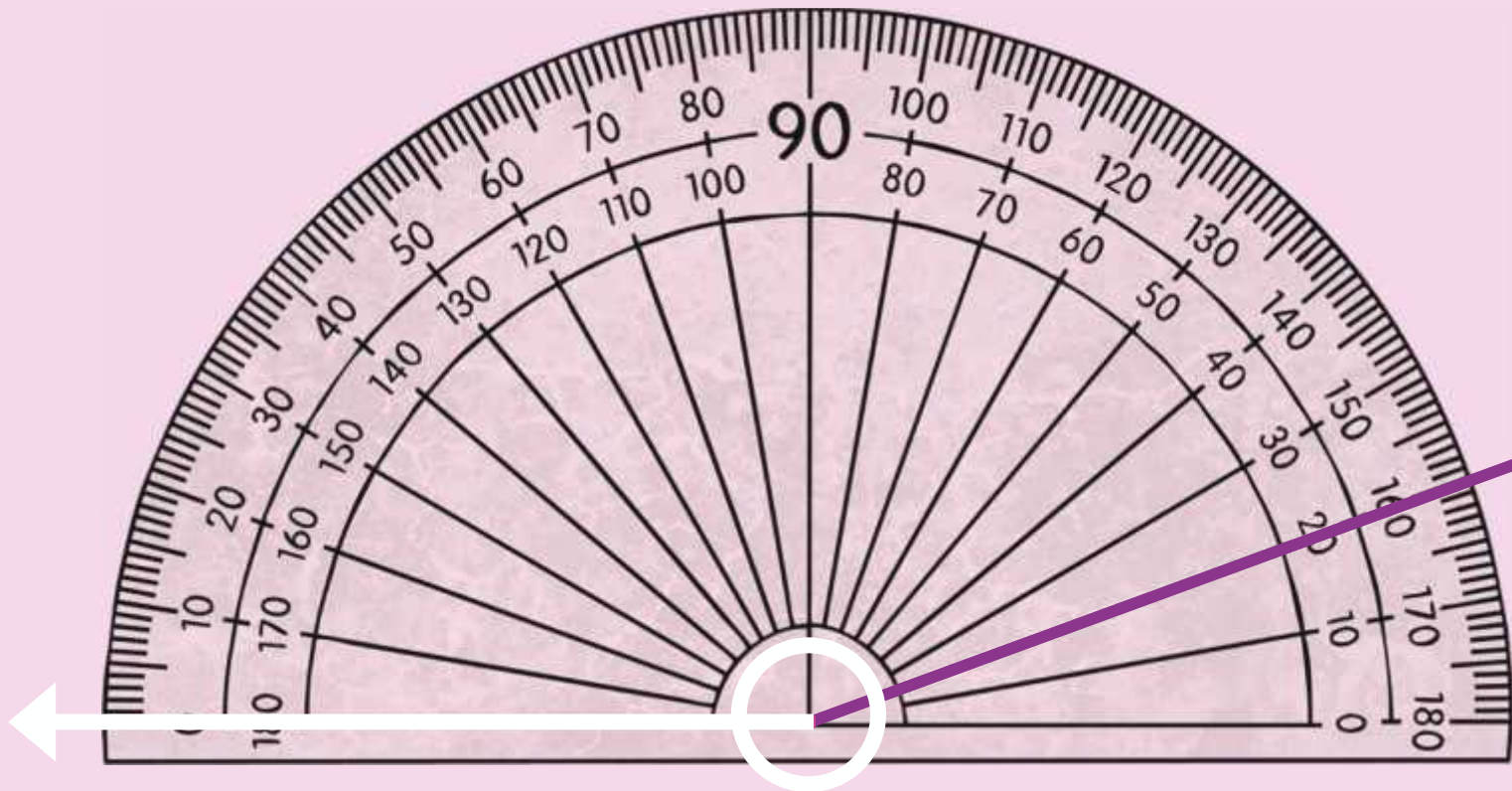
Look carefully at how the numbers on the scale count from 0° to 180° in BOTH directions.



The Protractor

Here is an obtuse angle.

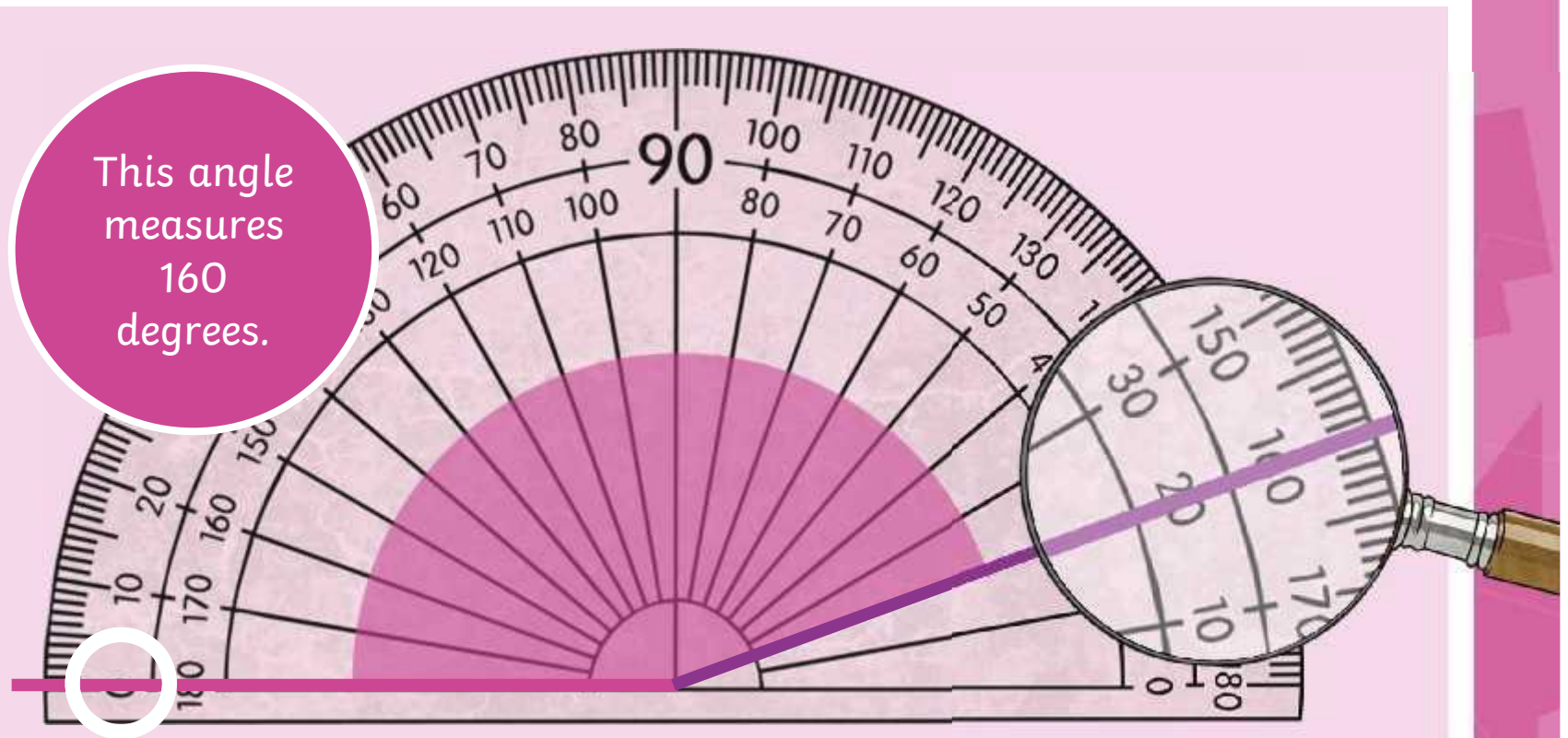
To measure the angle in degrees, we line the centre of the protractor up with the vertex of the angle. One of the angle lines needs to be lined up with the protractor base.



The Protractor

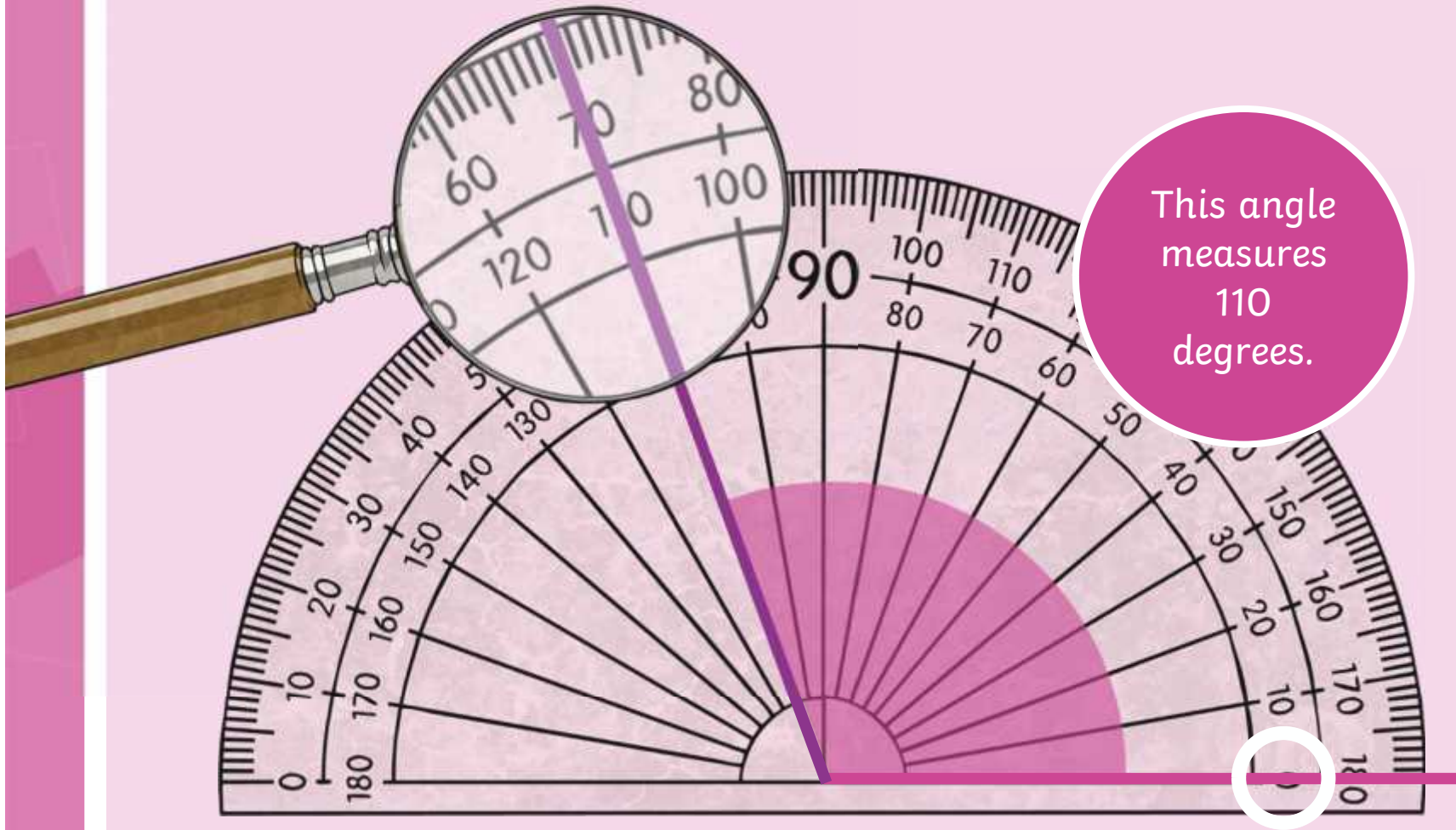
The horizontal line of the angle is on the left side of the protractor, so we count from zero along the outside scale clockwise.

To find out how many degrees the angle measures, we look at where the purple line of the angle is pointing to on the scale.



The Protractor

The horizontal line of the angle is on the right side of the protractor, so we count from zero along the inside scale, anticlockwise.

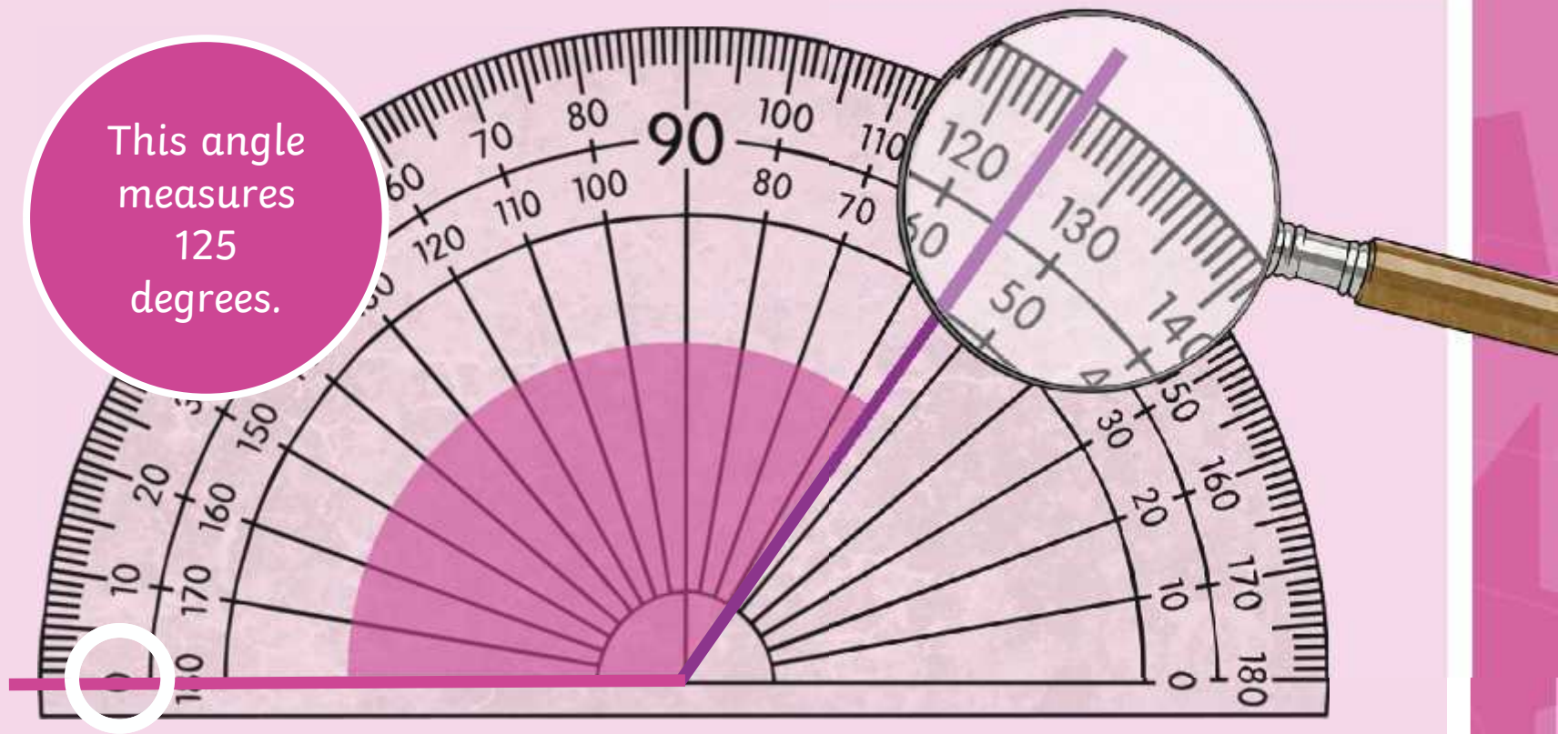


The Protractor

This angle measures halfway between the marked intervals on the scale. How many degrees does that angle measure? Explain your reasoning.

Multiples of 10 degrees are labelled. Multiples of 5 are shown by the longer increments that are unlabelled, halfway between the multiples of 10.

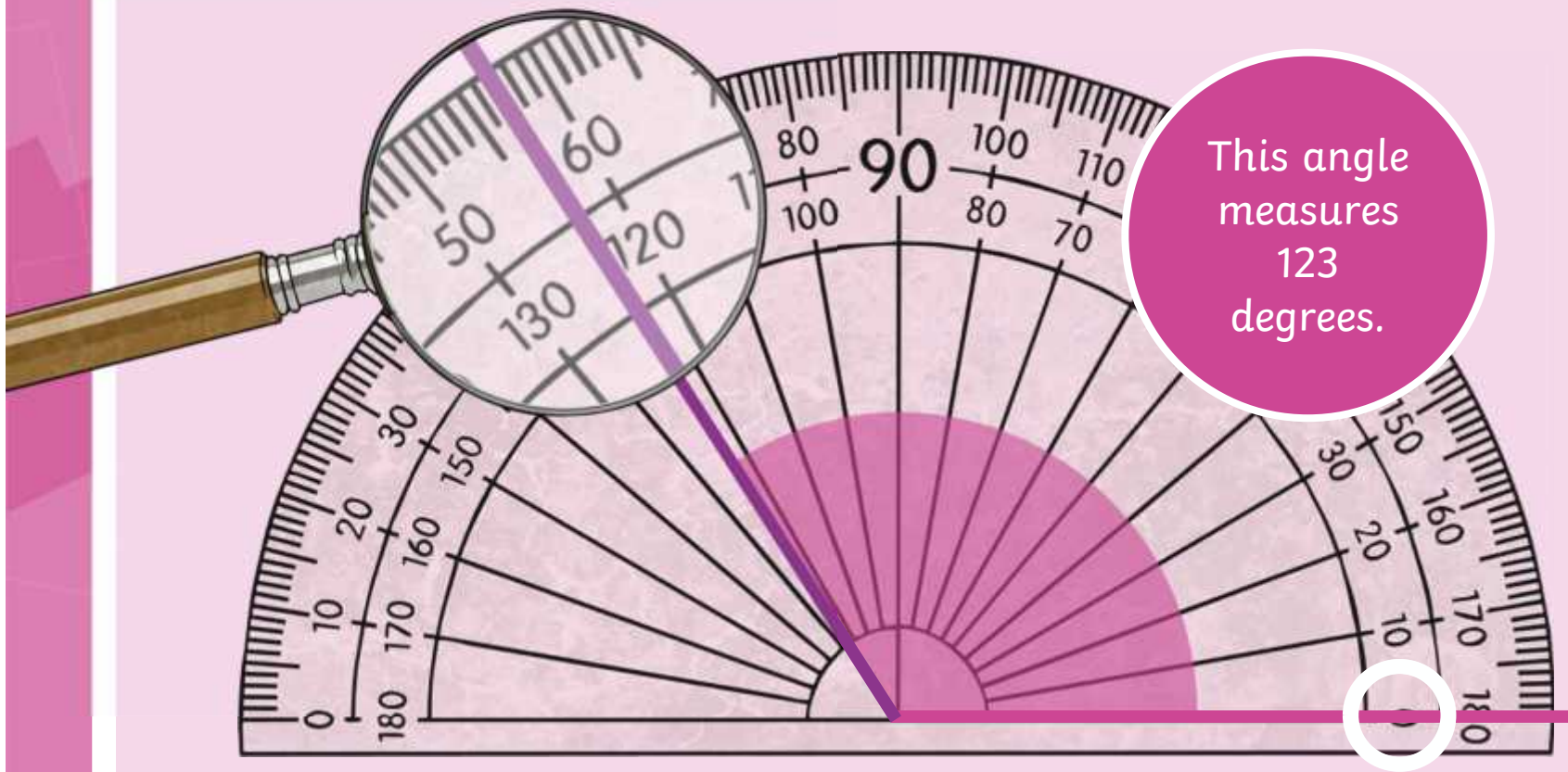
This angle measures 125 degrees.



The Protractor

This angle is between the marked intervals on the anticlockwise scale. How many degrees does that angle measure? Explain your reasoning.

Each increment on the outside scale measures 1 degree. We can use these increments to help us, even when we are counting anticlockwise on the inside scale.



Reasoning

Ola and Kamil are using a protractor to measure this obtuse angle. Who has measured the angle correctly? Explain your reasoning.

Explain the mistake the other child has made.



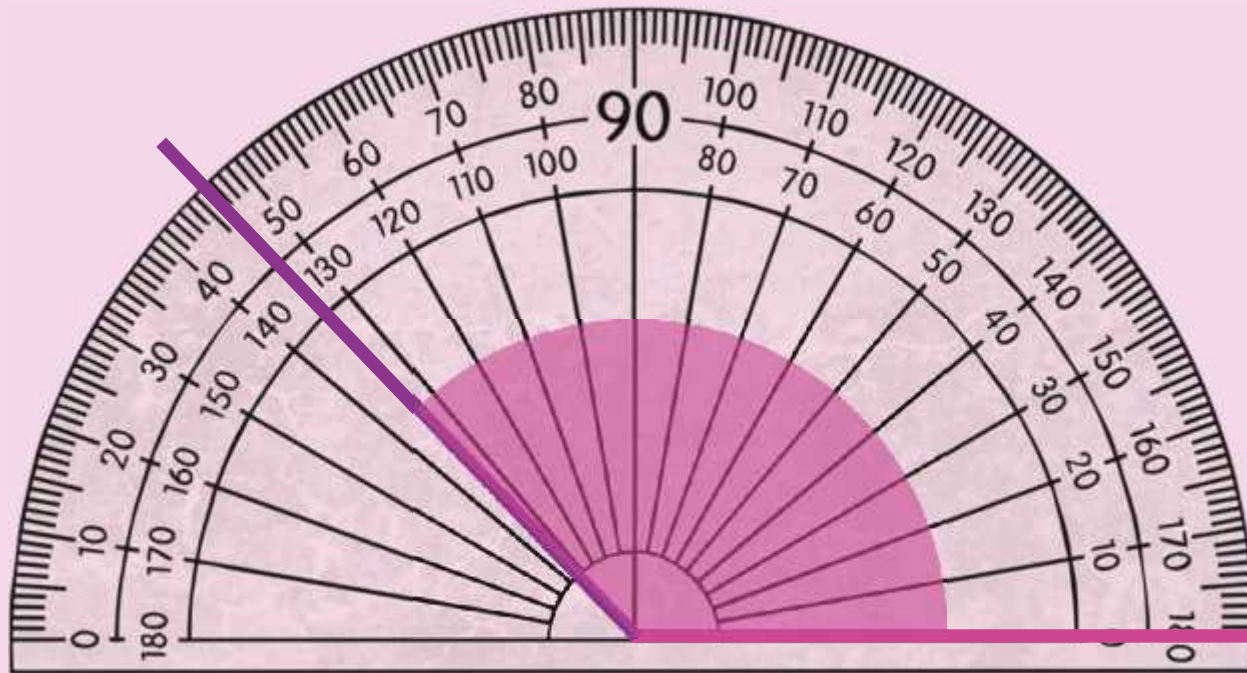
Ola

I think the angle measures 134°



Kamil

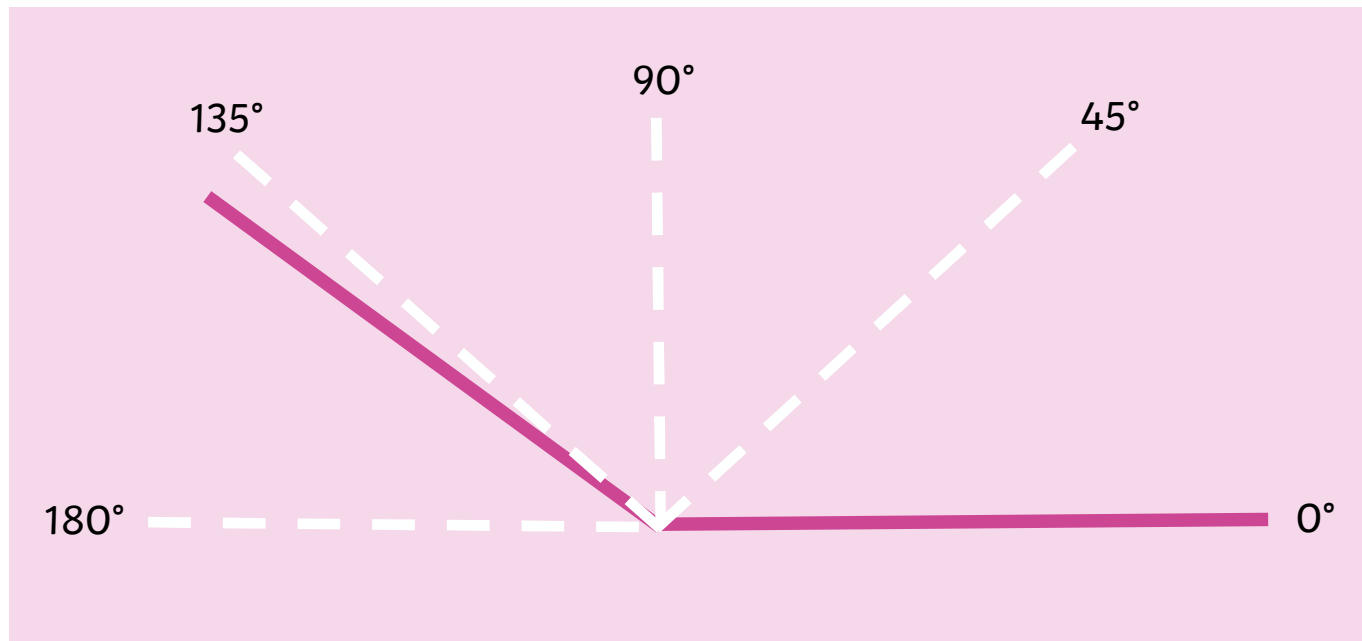
I think the angle measures 46°



Reasoning

Before I measure this obtuse angle with my protractor, I estimate this angle will be greater than 135° .

Explain how Ola has used her understanding of angles to make a sensible estimate.



Ola has used her understanding of right angles and multiples of 45° to estimate that this angle is greater than 135° .

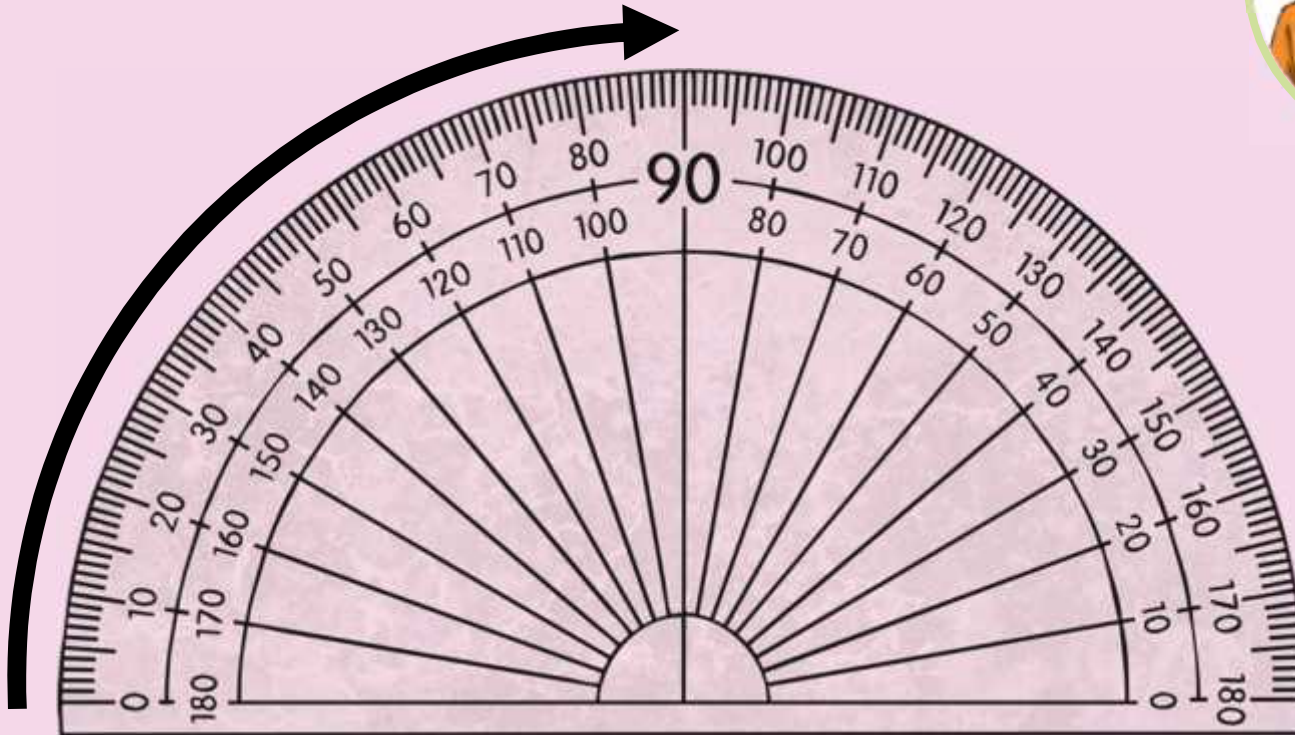
Reasoning

Obtuse angles are always measured using the clockwise scale.
Kamil knows that an obtuse angle is greater than 90° .
For this angle, he should have measured anticlockwise,
using the inside scale.

Prove that Kamil is incorrect.



Kamil



Measuring Angles in Degrees

Measuring Obtuse Angles

To measure obtuse angles in degrees.

1) What is the size of the obtuse angle marked in each diagram?

a)

b)

c)

2) Use a protractor to measure these obtuse angles.

_____°

_____°

_____°

Maths (Properties of Shapes (Measures and Area Angles) Lesson 3) 4 Measuring Obtuse Angles

Measuring Obtuse Angles

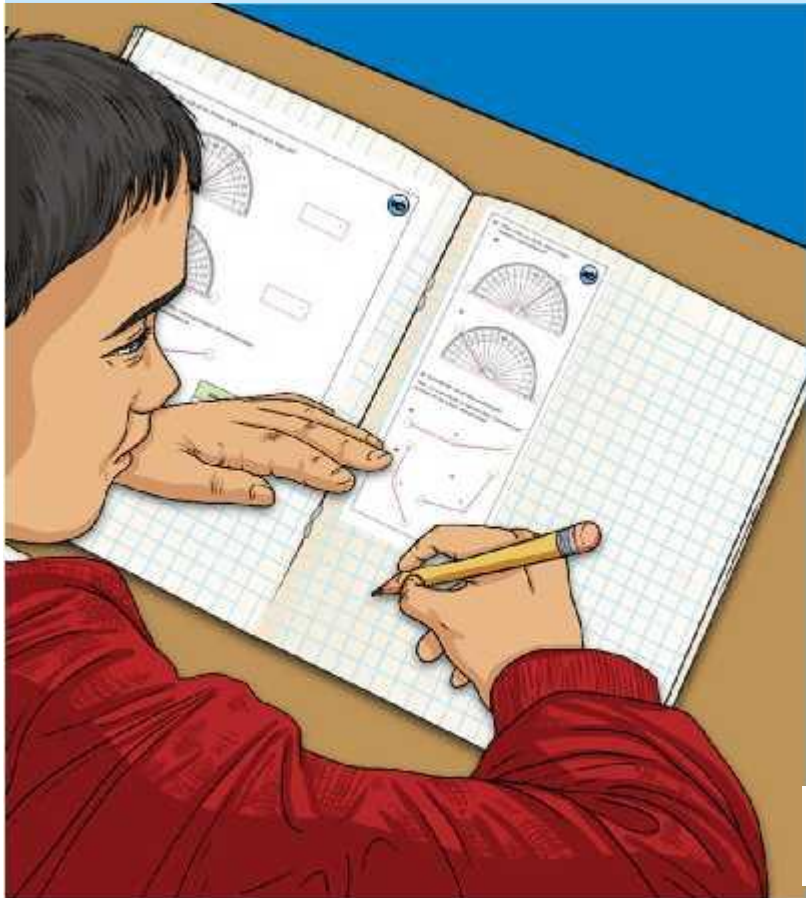
To measure _____°

Use a pencil and ruler to draw obtuse angles of any size.
 Estimate the size of each of the angle you have drawn and _____°
 Then, use a protractor to measure your angle. How close was your estimation?

I estimate this angle is _____° Reasoning: _____ The angle measures _____° How close was your estimation? _____	I estimate this angle is _____° Reasoning: _____ The angle measures _____° How close was your estimation? _____	I estimate this angle is _____° Reasoning: _____ The angle measures _____° How close was your estimation? _____
--	--	--


Diving into Mastery

Dive in by completing your own activity!




21. What is the size of the obtuse angle marked in each diagram?

i)




ii)




22. Estimate the size of 2 acute angles. Then use a protractor to measure them. Compare your estimates to the actual measurements.


i)



ii)



iii)



Estimate	Measurement
i)	
ii)	
iii)	

Protractor

180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0

Aim

- To measure obtuse angles in degrees.

Success Criteria

- I can read obtuse angles shown on a protractor.
- I can use a protractor to accurately measure angles greater than 90 degrees.
- I can read both the inside and outside scale of the protractor accurately.



Aim: To measure obtuse angles in degrees.				Date:					
				Delivered By:			Support:		
Success Criteria	Me	Friend	Teacher	T	PPA	S	I	AL	GP
I can read obtuse angles shown on a protractor.				Notes/Evidence					
I can use a protractor to accurately measure angles greater than 90 degrees.									
I can read both the inside and outside scale of the protractor accurately.									
Next Steps									
) _____									
) _____									

T	Teacher	I	Independent
PPA	Planning, Preparation and Assessment	AL	Adult Led
S	Supply	GP	Guided Practice

Aim: To measure obtuse angles in degrees.				Date:					
				Delivered By:			Support:		
Success Criteria	Me	Friend	Teacher	T	PPA	S	I	AL	GP
I can read obtuse angles shown on a protractor.				Notes/Evidence					
I can use a protractor to accurately measure angles greater than 90 degrees.									
I can read both the inside and outside scale of the protractor accurately.									
Next Steps									
) _____									
) _____									

T	Teacher	I	Independent
PPA	Planning, Preparation and Assessment	AL	Adult Led
S	Supply	GP	Guided Practice

- 1) a) 118°
b) 146°



- 2)
a) 160°
b) 135°
c) 110°

- 1) Selma is correct as the angle is measured anticlockwise on the protractor. Osman measured clockwise by mistake.
- 2) Pasha knows this is an obtuse angle and has made a sensible estimate, as the angle is close to $90^\circ + 45^\circ = 135^\circ$.



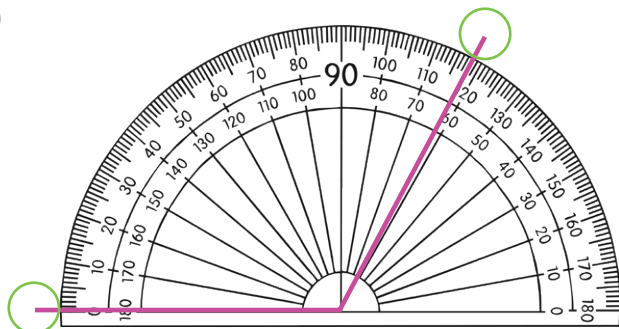
- 1) Various Answers



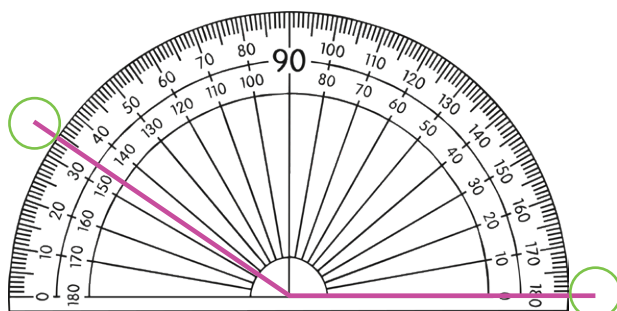


1) What is the size of the obtuse angle marked in each diagram?

a)

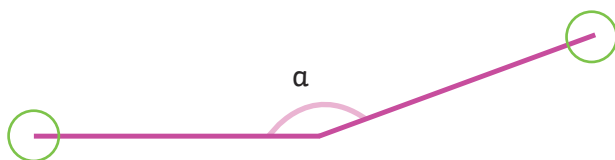


b)

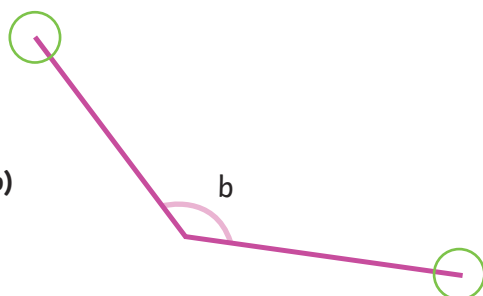


2) Estimate the size of these obtuse angles. Then, use a protractor to measure them. Compare your estimates to the actual measurements.

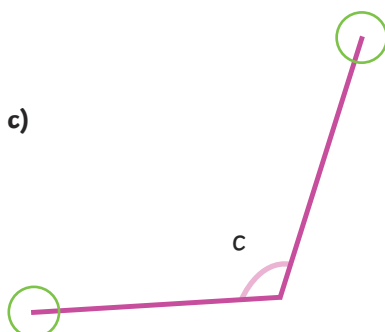
a)



b)



c)



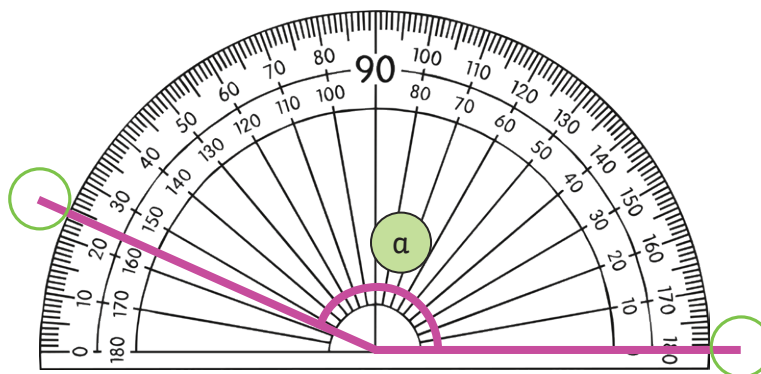
Estimate	Measurement
a)	
b)	
c)	



1) Selma and Osman are using a protractor to measure this obtuse angle.

Who has measured the angle correctly? Explain your reasoning.

Explain the mistake that the other child has made.



I think the angle measures 156°

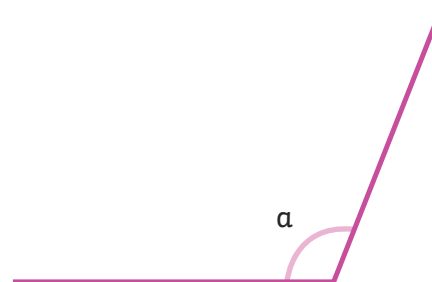


I think the angle measures 24°

2)



I estimate this angle is 120°



Has Pasha used his knowledge of right angles to make a good estimate? Explain your answer.

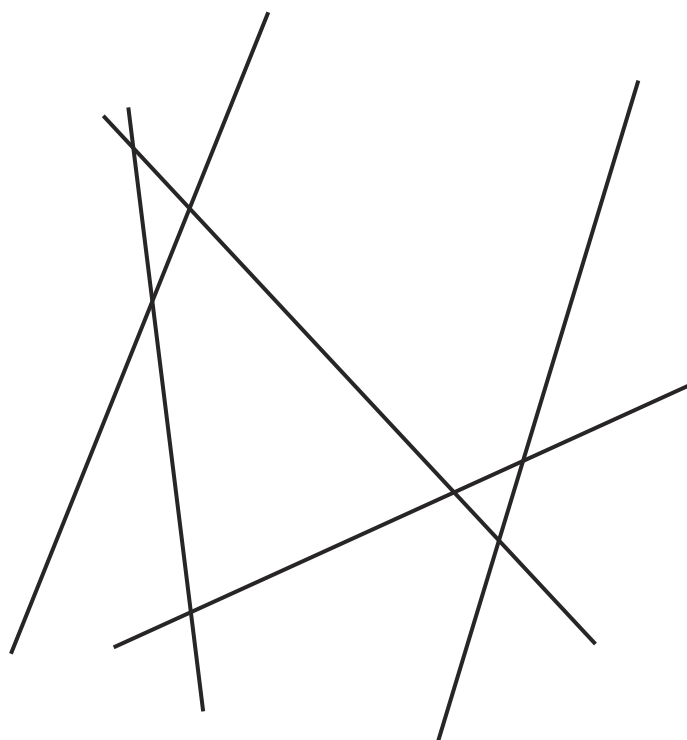


1)

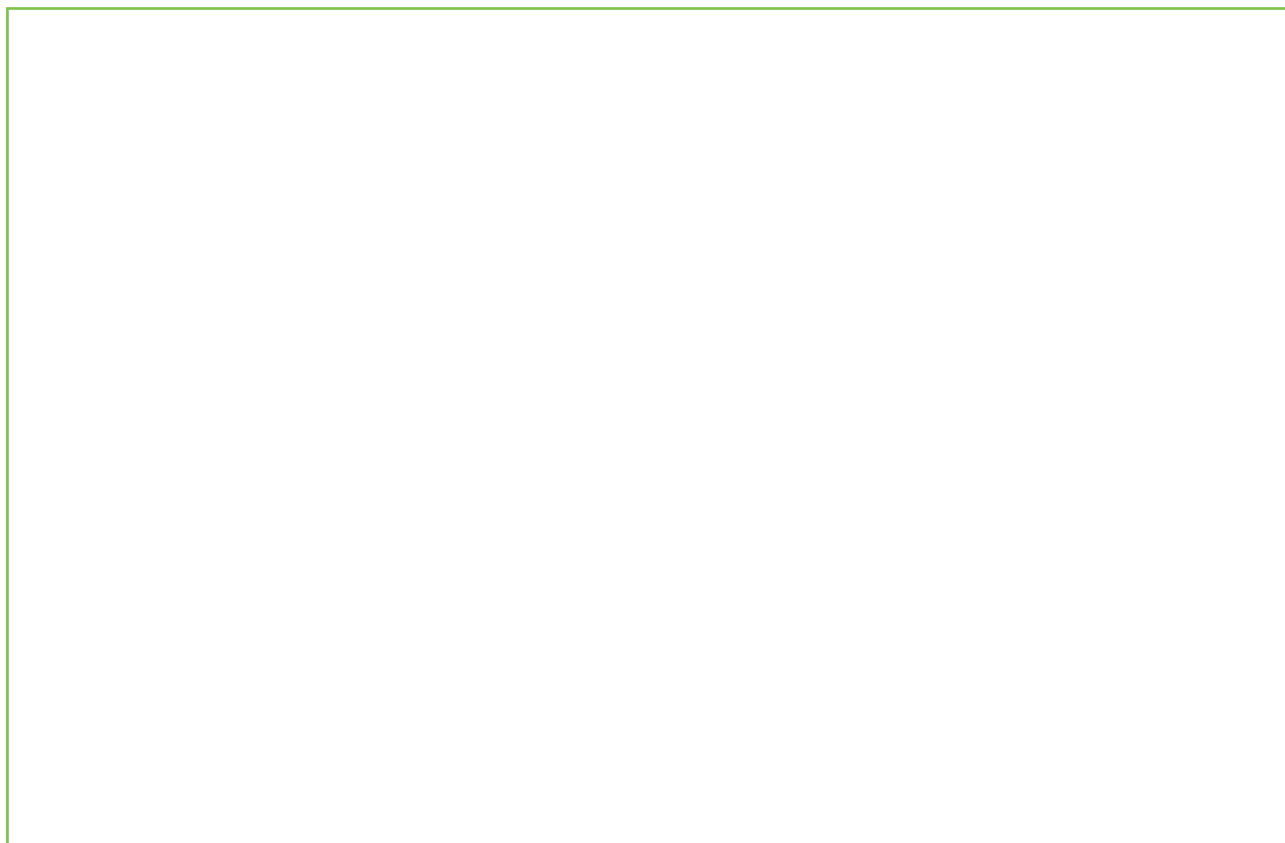
a) Layla has drawn a series of intersecting lines.

Colour in any obtuse angles you can see.

Use a protractor to check that the angles you have estimated as obtuse are greater than 90° .



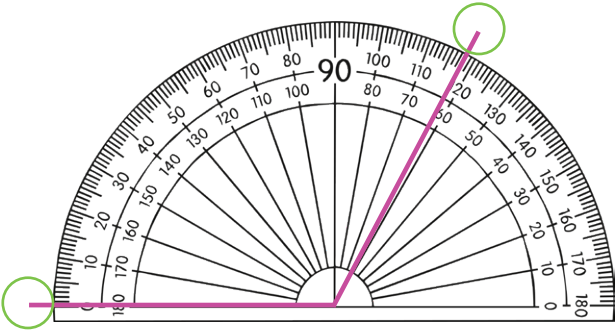
b) Draw your own picture using only straight lines. Measure and label all the obtuse angles in your drawing.



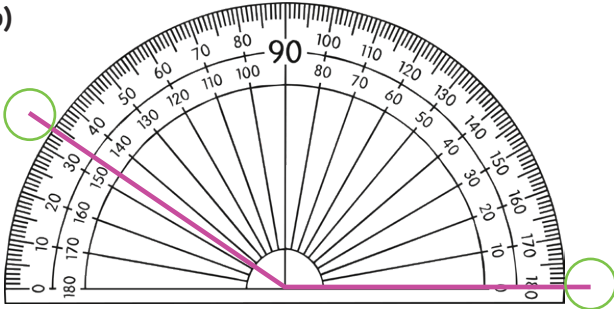
1) What is the size of the obtuse angle marked in each diagram?



a)



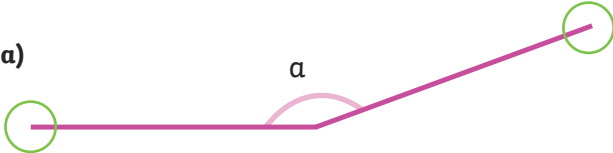
b)



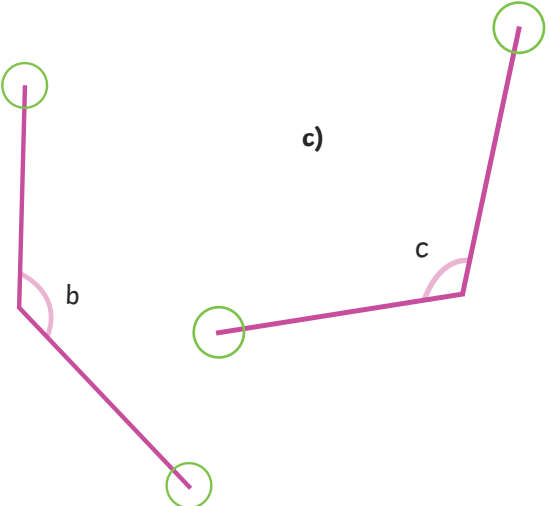
2) Estimate the size of these acute angles.

Then, use a protractor to measure them. Compare your estimates to the actual measurements.

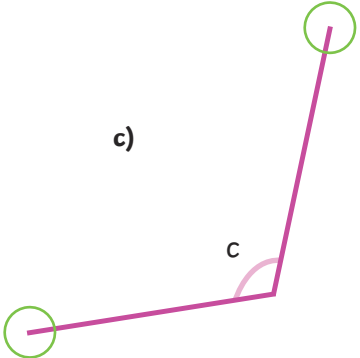
a)



b)



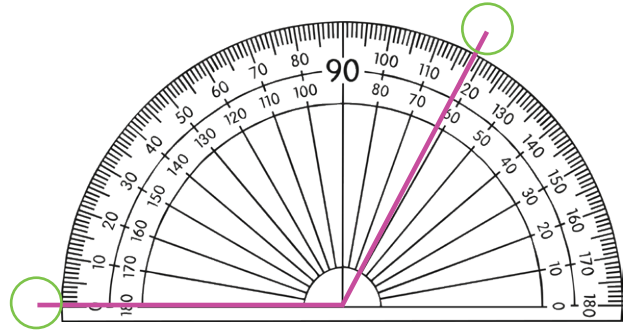
c)



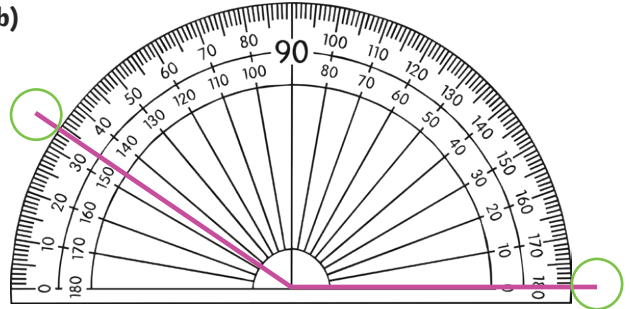
1) What is the size of the obtuse angle marked in each diagram?



a)



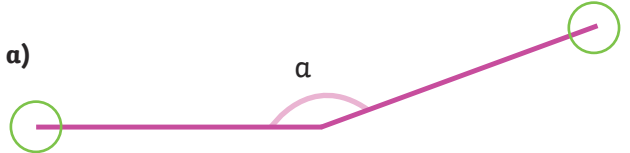
b)



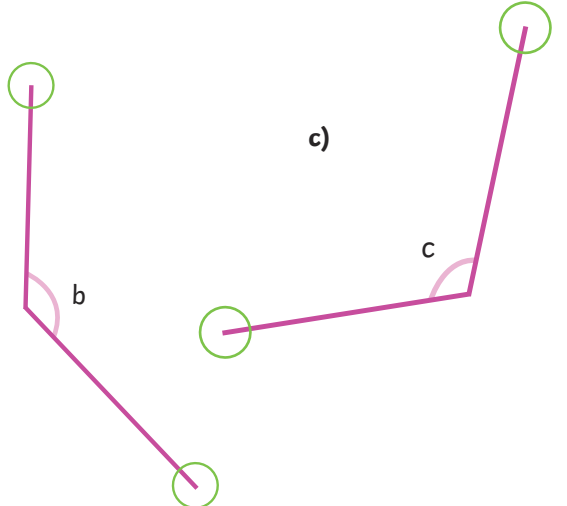
2) Estimate the size of these acute angles.

Then, use a protractor to measure them. Compare your estimates to the actual measurements.

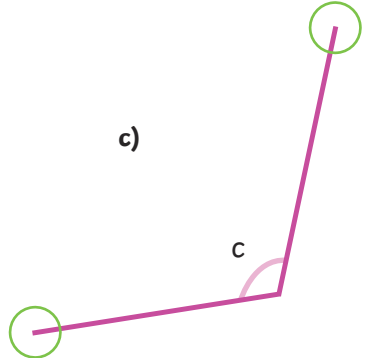
a)



b)



c)

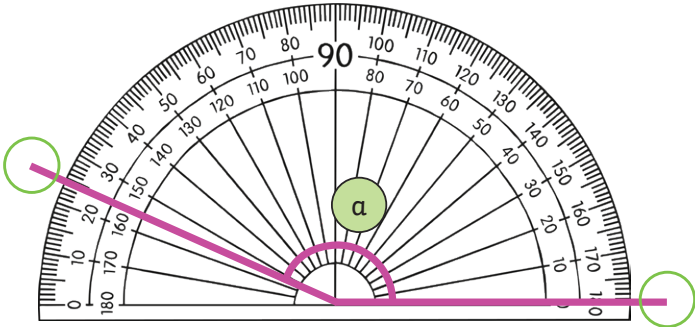


1) Selma and Osman are using a protractor to measure this obtuse angle.



Who has measured the angle correctly?
Explain your reasoning.

Also, explain the mistake the other child has made.



I think the angle measures 156°

Selma



I think the angle measures 24°

Osman

2)



I estimate this angle is 120°

Pasha

Has Pasha used his knowledge of right angles to make a good estimate? Explain your answer.

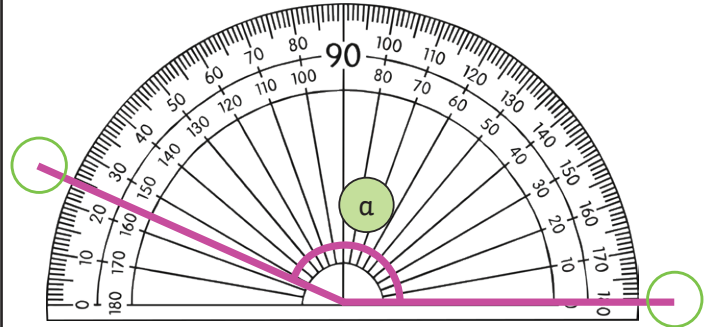


1) Selma and Osman are using a protractor to measure this obtuse angle.



Who has measured the angle correctly?
Explain your reasoning.

Also, explain the mistake the other child has made.



I think the angle measures 156°

Selma



I think the angle measures 24°

Osman

2)



I estimate this angle is 120°

Pasha

Has Pasha used his knowledge of right angles to make a good estimate? Explain your answer.



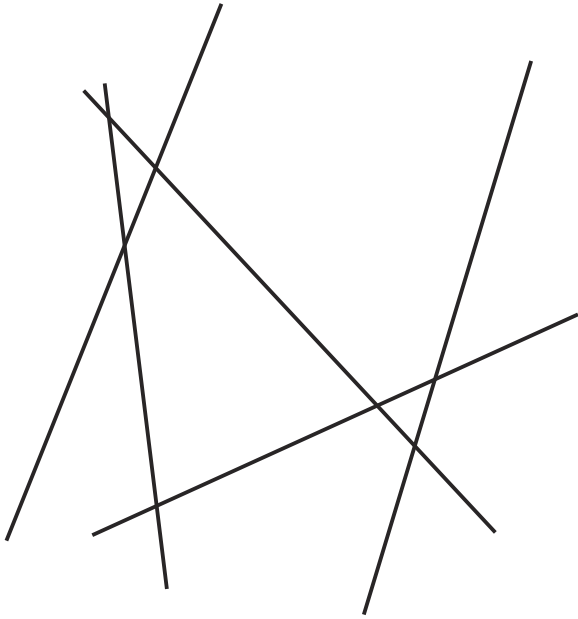
1)

- a) Layla has drawn a series of intersecting lines.



Colour in any obtuse angles you can see.

Use a protractor to check that the angles you have estimated as obtuse are greater than 90° .



- b) Draw your own picture using only straight lines. Measure and label all the obtuse angles in your drawing.

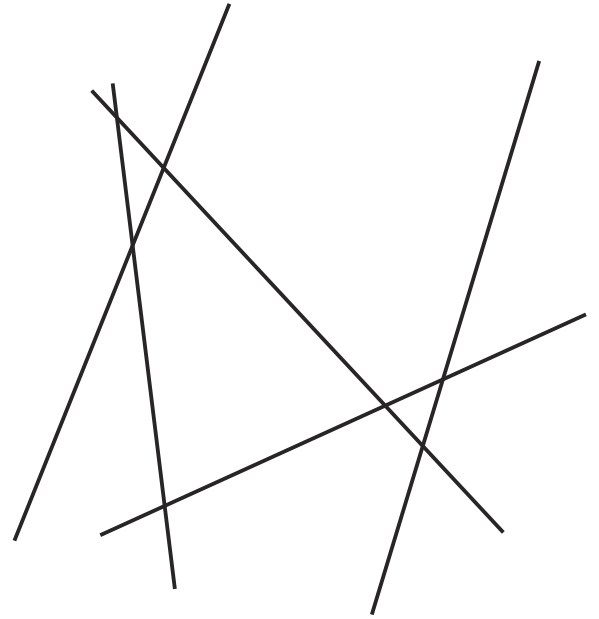
1)

- a) Layla has drawn a series of intersecting lines.



Colour in any obtuse angles you can see.

Use a protractor to check that the angles you have estimated as obtuse are greater than 90° .

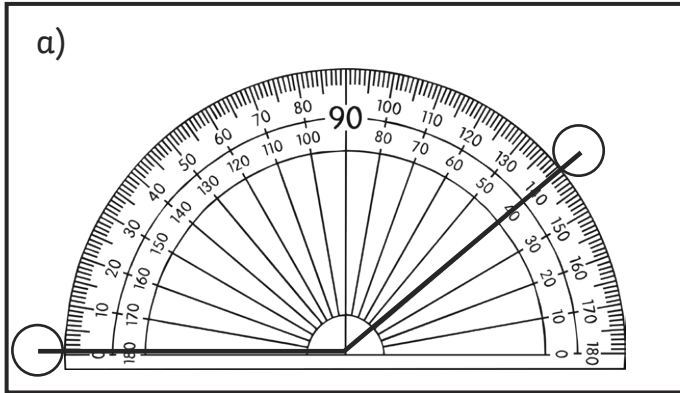


- b) Draw your own picture using only straight lines. Measure and label all the obtuse angles in your drawing.

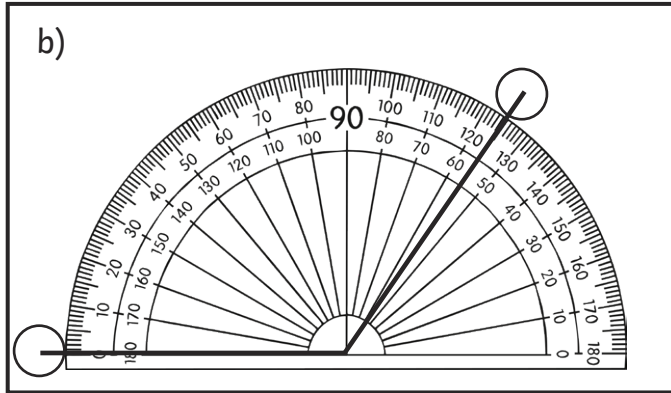
Measuring Obtuse Angles

To measure obtuse angles in degrees.

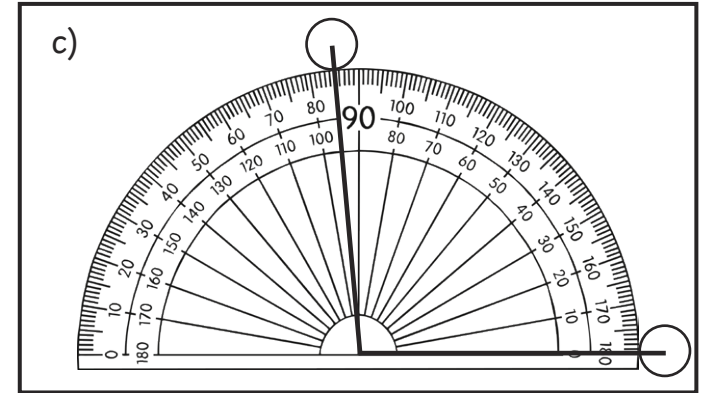
1) What is the size of the obtuse angle marked in each diagram?



= _____ °

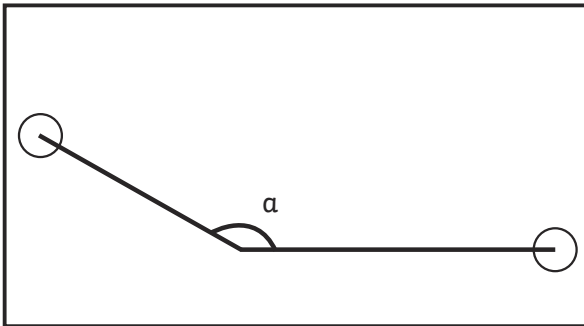


= _____ °

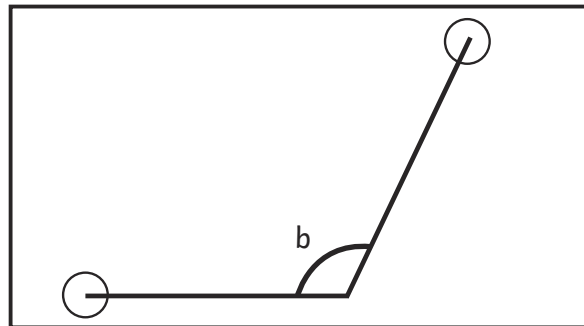


= _____ °

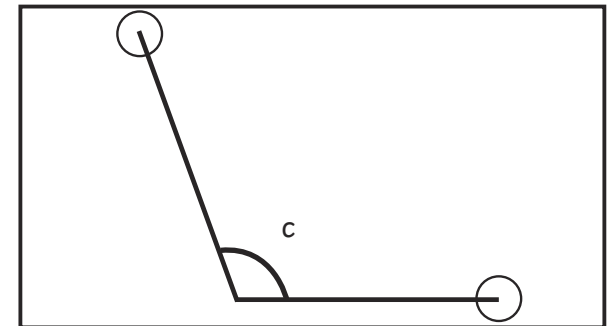
2) Use a protractor to measure these obtuse angles.



= _____ °



= _____ °

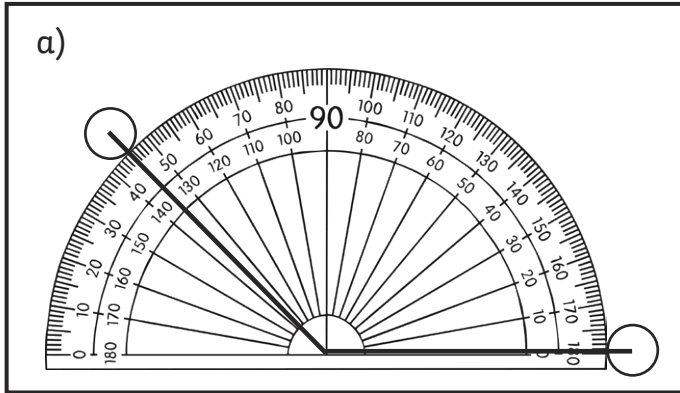


= _____ °

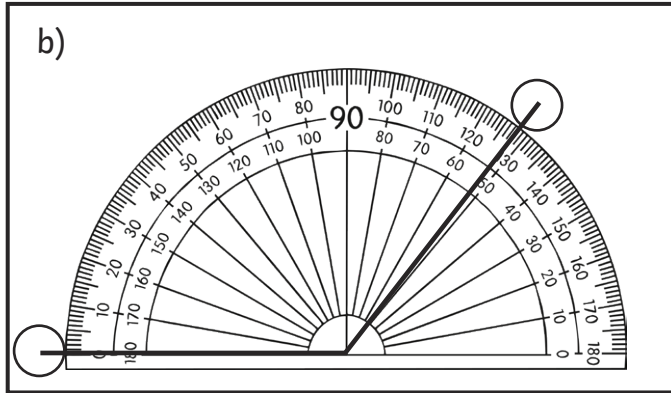
Measuring Obtuse Angles

To measure obtuse angles in degrees.

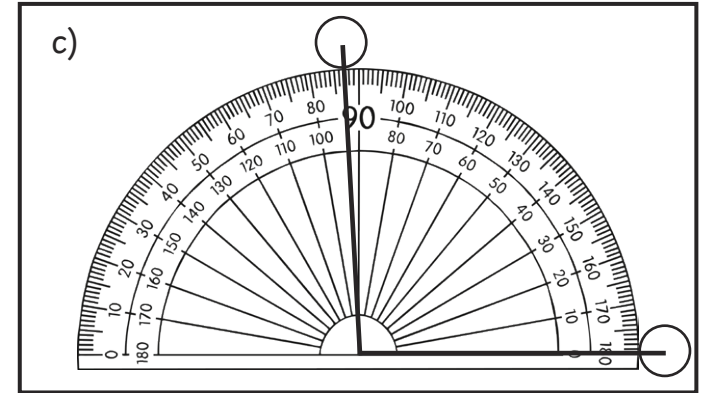
1) What is the size of the obtuse angle marked in each diagram?



= _____ °

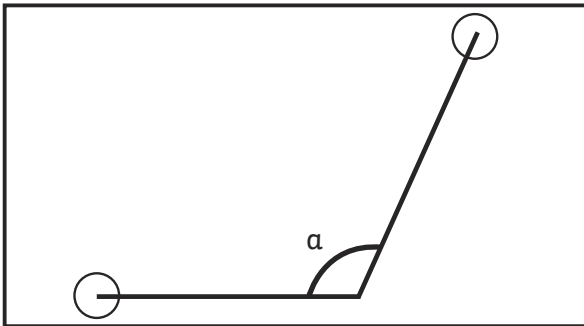


= _____ °

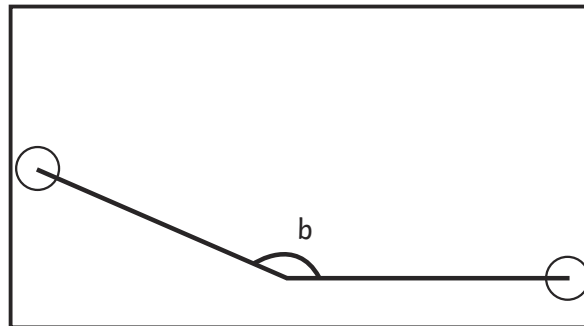


= _____ °

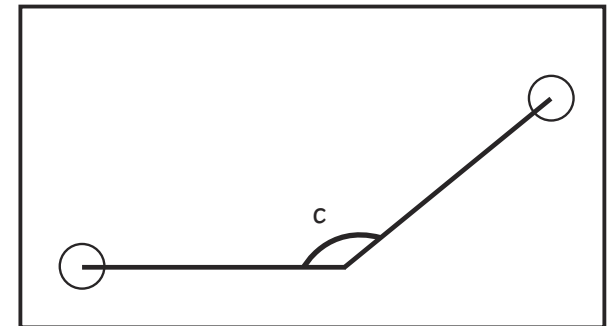
2) Use a protractor to measure these obtuse angles.



= _____ °



= _____ °



= _____ °

Measuring Obtuse Angles

To measure obtuse angles in degrees.



Use a pencil and ruler to draw obtuse angles of any size.

Estimate the size of each angle you have drawn and explain your reasoning.

Then, use a protractor to measure your angle. How close were you to your estimation?

I estimate this angle is _____ ° Reasoning: _____ _____
The angle measures _____ ° How close was your estimation? _____

I estimate this angle is _____ ° Reasoning: _____ _____
The angle measures _____ ° How close was your estimation? _____

I estimate this angle is _____ ° Reasoning: _____ _____
The angle measures _____ ° How close was your estimation? _____

Measuring Obtuse Angles **Answers**

1) **140°**

Also accept 139° or 141°

125°

Also accept 124° or 126°

95°

Also accept 94° or 96°

2) **150°**

Also accept 149° or 151°

115°

Also accept 114° or 116°

110°

Also accept 109° or 111°

Measuring Obtuse Angles **Answers**

1) **135°**
Also accept 134° or 136°

128°
Also accept 127° or 129°

93°
Also accept 92° or 94°

2) **114°**
Also accept 113° or 115°

156°
Also accept 155° or 157°

141°
Also accept 140° or 142°

Properties of Shapes | Measuring Obtuse Angles

To measure obtuse angles in degrees.		
I can read obtuse angles shown on a protractor.		
I can use a protractor to accurately measure angles greater than 90 degrees.		
I can read both the inside and outside scale of the protractor accurately.		

Properties of Shapes | Measuring Obtuse Angles

To measure obtuse angles in degrees.		
I can read obtuse angles shown on a protractor.		
I can use a protractor to accurately measure angles greater than 90 degrees.		
I can read both the inside and outside scale of the protractor accurately.		

Properties of Shapes | Measuring Obtuse Angles

To measure obtuse angles in degrees.		
I can read obtuse angles shown on a protractor.		
I can use a protractor to accurately measure angles greater than 90 degrees.		
I can read both the inside and outside scale of the protractor accurately.		

Properties of Shapes | Measuring Obtuse Angles

To measure obtuse angles in degrees.		
I can read obtuse angles shown on a protractor.		
I can use a protractor to accurately measure angles greater than 90 degrees.		
I can read both the inside and outside scale of the protractor accurately.		

Properties of Shapes | Measuring Obtuse Angles

To measure obtuse angles in degrees.		
I can read obtuse angles shown on a protractor.		
I can use a protractor to accurately measure angles greater than 90 degrees.		
I can read both the inside and outside scale of the protractor accurately.		

Properties of Shapes | Measuring Obtuse Angles

To measure obtuse angles in degrees.		
I can read obtuse angles shown on a protractor.		
I can use a protractor to accurately measure angles greater than 90 degrees.		
I can read both the inside and outside scale of the protractor accurately.		

Properties of Shapes | Measuring Obtuse Angles

To measure obtuse angles in degrees.		
I can read obtuse angles shown on a protractor.		
I can use a protractor to accurately measure angles greater than 90 degrees.		
I can read both the inside and outside scale of the protractor accurately.		

Properties of Shapes | Measuring Obtuse Angles

To measure obtuse angles in degrees.		
I can read obtuse angles shown on a protractor.		
I can use a protractor to accurately measure angles greater than 90 degrees.		
I can read both the inside and outside scale of the protractor accurately.		