



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

MATHEMATICS LESSON PLAN

GRADE 9

TERM 2: April – June

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. **TOPIC: GEOMETRY OF STRAIGHT LINES:** Angle relationships (**Lesson 1**)

2. **CONCEPTS & SKILLS TO BE ACHIEVED:**

By the end of the lesson learners should know and be able to write clear descriptions of the relationship between angles formed:

- perpendicular lines
- Intersecting lines

3. RESOURCES: DBE Workbook 1, Sasol-Inzalo Book 1, textbooks, protractor

4. PRIOR KNOWLEDGE: • angles

5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes)
Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.

6. INTRODUCTION(Suggested time: 10 Minutes)

Revise the work done in grade 8 using the following activity

Activity

1. Use a protractor to measure the sizes of all angles in each of the figures below. Write down your answer on each figure.

Note. The number written on figure 1 and figure 2 are not the sizes of the angles.

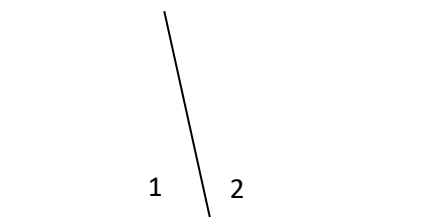


Figure 1

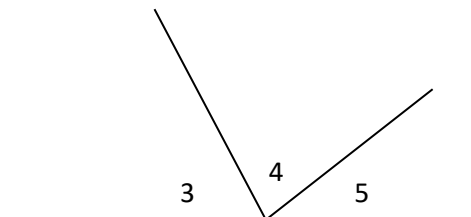


figure 2

2. Use your answers to fill in the angle sizes below

a) $\hat{1} + \hat{2} = \underline{\hspace{2cm}}$

b) $\hat{3} + \hat{4} + \hat{5} = \underline{\hspace{2cm}}$

Solutions

a) Size of $\hat{1} +$ size of $\hat{2} = 180^\circ$

b) Size of $\hat{3} +$ size of $\hat{4} +$ size of $\hat{5} = 180^\circ$

3. Which pair of angles are adjacent angles in figure 2?

Solution: $\hat{3}$ and $\hat{4}$; $\hat{4}$ and $\hat{5}$

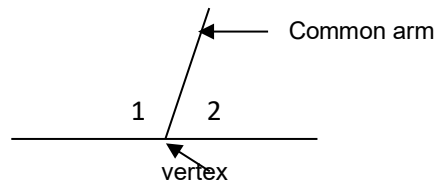
NB: 1. Draw a diagram that contains a common arm and vertex to illustrate how an angle and adjacent angles are formed.

2. Define the concept supplementary angles.



Solutions

1.



2. If two or more angles add up to 180° , they are called **supplementary angles**.
E.g. $\hat{1} + \hat{2}$

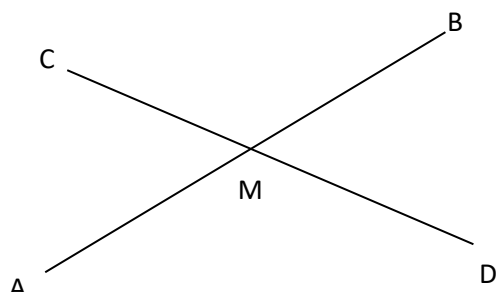
7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to)
<p>Present the following activity and let learners work in pairs.</p> <p>Activity 1</p> <p>In the figure below, AME is a straight line with equal supplementary angles $\hat{A}MC$ and $\hat{E}MC$ and line segment CM intersects AE at M.</p> <p>a) Measure the sizes of $\hat{A}MC$ and $\hat{E}MC$? b) What is the relationship between line segments AME and CM? Justify your answer.</p> <p>Solutions</p> <p>a) $\hat{A}MC = \hat{E}MC = 90^\circ$ b) $\hat{A}MC$ is perpendicular $\hat{E}MC$; $\hat{A}MC = \hat{E}MC = 90^\circ$</p>	<ul style="list-style-type: none">measure the angles in activity 1 and give feedback

Activity 2

Present the activity below and let learners work in small group.

Consider the figure below, lines AB and CD intersect at point M.



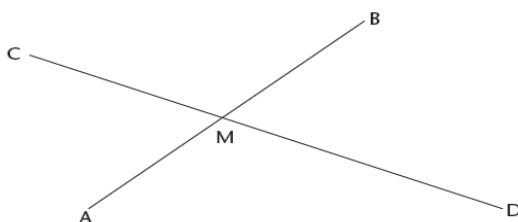
- Which pair of angles are equal?
- Can you explain why they are equal?
- What is the size of $\widehat{CMA} + \widehat{DMA}$ and $\widehat{CMA} + \widehat{CMB}$?
Provide reason for your answer.
- Is it true that $\widehat{CMA} + \widehat{DMA} = \widehat{CMA} + \widehat{CMB}$?
- What conclusion can you made in question "d" above.

Solutions

- $\widehat{AMD} = \widehat{CMB}$ and $\widehat{AMC} = \widehat{BMD}$
- They are vertically opposite angles
- Both = 180° adjacent angles on a straight line
- Yes
- Vertically opposite angles are equal.

Activity 3

Let learners draw the figure below and work individually.



If $\widehat{BMC} = 125^\circ$, what is the size of \widehat{AMD} , and provide a reason for your answer

Solution: $\widehat{AMD} = \widehat{BMC} = 125^\circ$ vertically opposite angles

- respond to the questions in activity 2 in small groups.

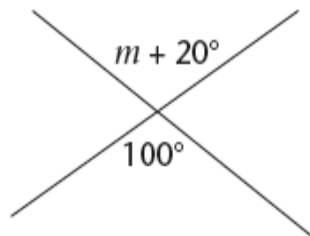
- respond to the question in activity 3 individually.



Activity 4

Let learners redraw the diagram and work individually.

1) Calculate with reason the value of m .

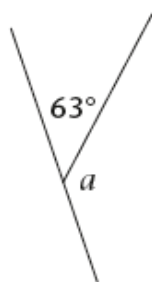


Solution

Statement	Reason
$m + 20^\circ = 100^\circ$	vertically opposite angles,
vertically $m + 20^\circ - 20^\circ = 100^\circ - 20^\circ$	if two lines intersect the two
$= 80^\circ$	opposite angles are equal.

- redraw the diagram and calculate with reason the value of m .

2) Calculate the size of a .

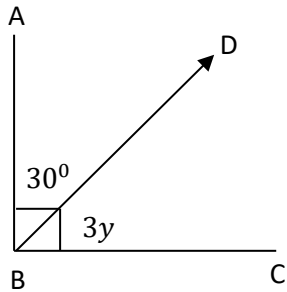


Statement	Reason
$a + 63^\circ = 180^\circ$	angles on a straight line are
supplementary	
$a + 63^\circ - 63^\circ = 180^\circ - 63^\circ$	add -63 to both sides of the equation
$= 117^\circ$	

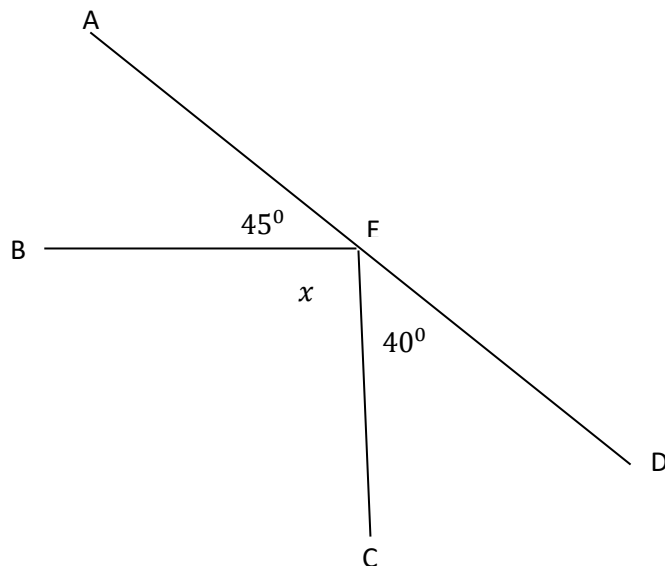
- redraw the diagram and calculate with reason the value of a .

8. CLASSWORK(Suggested time: 15 minutes)

1. Calculate the value of x and y in each of the following. Give reasons for all your answer.



2.



9. CONSOLIDATION/CONCLUSION& HOMEWORK(Suggested time: 5 minutes)



a) **Emphasise that:**

- the sum of angles that are formed on a straight line is equal to 180° .
- if lines intersect, then vertically opposite angles are always equal.
- when one line forms two equal angles where it meets another line, the two lines are said to be perpendicular.
- learners should always give reasons for the statement they make.
- learners should use the correct notation of angles.
- angles that share a vertex and common arm are said to be adjacent.
- if two lines meet and form an angle of 90° , then the two lines are perpendicular.

b) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo Books, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework

- Sasol-Inzalo Book: Page 222, No. 5

Worksheet

Name: _____

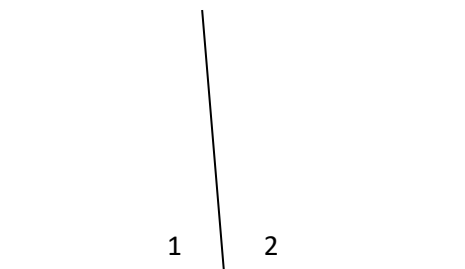


Figure 1

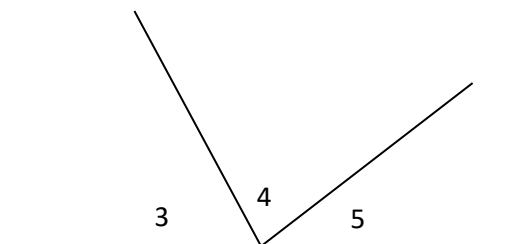


Figure 2

