



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:** Solving problems (**Lesson 5**)

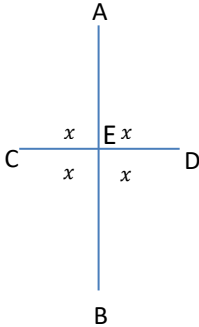
**2. CONCEPTS & SKILLS TO BE ACHIEVED:**

**By the end of the lesson learners should know and be able to** solve geometric problems using the relationships between pairs of angles formed by perpendicular lines and intersecting lines.

<b>3. RESOURCES:</b>	DBE Workbook 1, Sasol-Inzalo Book 1, textbooks
<b>4. PRIOR KNOWLEDGE:</b>	<ul style="list-style-type: none"> <li>• perpendicular lines and intersecting lines</li> <li>• solution of simple equations</li> <li>• substitution</li> </ul>
<p><b>5. REVIEW AND CORRECTION OF HOMEWORK</b> (suggested time: 10 minutes)</p> <p>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.</p>	
<p><b>6. INTRODUCTION</b> (Suggested time: 10 Minutes)</p>	
<p><b>Activity 1</b></p> <p>Ask probing questions to revise the relationship between angles formed by perpendicular lines and intersecting lines.</p> <ul style="list-style-type: none"> <li>• the sum of the angles on a straight line is <math>180^\circ</math></li> <li>• if lines are perpendicular lines, then adjacent supplementary angles are each equal to <math>90^\circ</math>.</li> <li>• if lines intersect, then vertically opposite angles are equal.</li> </ul> <p><b>Activity 2</b></p> <p>Ask learners to solve the following simple equations:</p> <p>(a) <math>2x + 4 = 12</math></p> <p>(b) <math>3x - 7 = 27</math></p> <p>Discuss the solutions with the learners</p> <p>Solution of (a)</p> $2x + 4 = 12$ $2x = 8 \quad \text{(add } -4 \text{ on both sides of the equation)}$ $\frac{2x}{2} = \frac{8}{2} \quad \text{(use the multiplicative inverse of 2 on both sides)}$ $x = 2$ <p><b>Note:</b> Emphasise additive and multiplicative inverses.</p>	



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

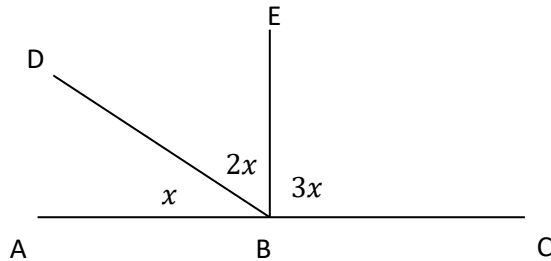
Teaching activities	Learning activities (Learners are expected to:)
<p><b>Note:</b> In the next set of lessons learners will have to solve problems using their knowledge about relationship between angles formed by perpendicular lines and intersecting lines. It is important that learners will use a problem solving strategy.</p> <ul style="list-style-type: none"> <li>• They need to work in a logical and systematic fashion to solve problems.</li> <li>• They need to be equipped with skills on how to read and use the information in a problem.</li> <li>• How to set up their argument in order to determine the solution to the problem.</li> </ul> <p><b>Activity 1</b></p> <p>Demonstrate to learners how to solve a problem using knowledge of perpendicular and intersecting lines.</p> <p><b>Example 1</b></p> <p>Two lines AB and CD meet at E. The angles formed at the vertex E are each equal to <math>x^\circ</math>. Show by calculation that <math>AB \perp CD</math>.</p>	<ul style="list-style-type: none"> <li>• Follow the demonstration and take part in the discussions.</li> <li>• Copy the examples in their notebooks.</li> </ul>
<p><b>Solution</b></p>  <p><math>x = 360^\circ</math> (angles around a point)</p> $x = \frac{360^\circ}{4}$ $x = 90^\circ$ <p><math>\therefore AB \perp CD</math></p>	<p>Emphasize the following to learners:</p> <ul style="list-style-type: none"> <li>-Remember that when you are asked to “show” or “prove” you must always state reasons</li> <li>-First draw a rough sketch to summarize the information in the question or add any extra information to a your sketch</li> <li>-Write an equation that represents your argument and provide a reason</li> <li>-Always make sure you answer the question in your final statement</li> </ul>



### Example 2

Given that ABC is a straight line,  $\hat{A}BD = x$ ,  $\hat{D}BC = 2x$ ,  $\hat{E}BC = 3$ .

- Find the value of  $x$ .
- What is the relationship between line AC and EB. Give a reason.



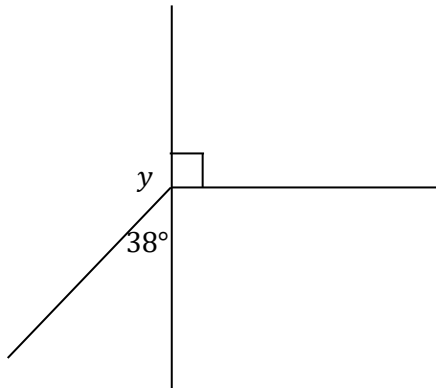
Solution

Statement	Reason
(a) $x + 2x + 3x = 180^\circ$ $6x = 180^\circ$ $\frac{6x}{6} = \frac{180}{6}$ $x = 30^\circ$ $\therefore \hat{A}BD = 30^\circ, \hat{D}BE = 2(30^\circ) = 60^\circ$	AB is a straight line Simplify
(b) $\hat{E}BC = 3x$ $= 3(30^\circ)$ $= 90^\circ$ $\therefore EB \perp ABC$	
<b>Note:</b> Emphasise to learners not to assume that EB is parallel to AC.	

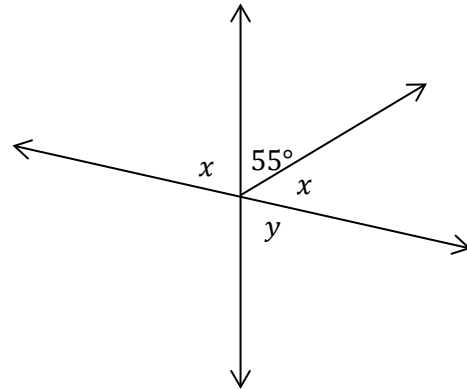
**8. CLASSWORK** (Suggested time: 15 minutes)

1. Find the value of  $x$  and  $y$ . Give reasons for your solutions.

(a)



(b)



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

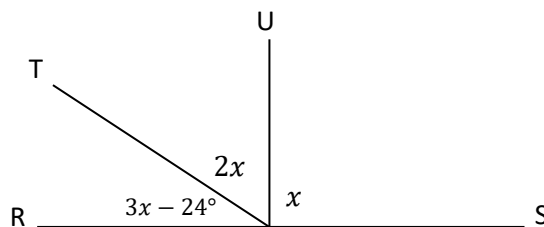
- a) **Emphasise that** in calculating angles we are not always provided with simple variables, but also given expressions to calculate angles, it is therefore necessary to use an equation to help you find an unknown angle.
- b) The primary purpose of Homework is to give each learner an opportunity to 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

In each of the following figures, find the value of  $x$ . Give reason.

1. RS is a straight line



2. AB and CD are straight lines.

