



MATHEMATICS LESSON PLAN

GRADE 9

TERM 2: APRIL – JUNE

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

1. **TOPIC: THEOREM OF PYTHAGORAS:** Solve problems using the theorem of Pythagoras. (Lesson 4)

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

By the end of the lesson, learners should be able to Use the Theorem of Pythagoras to solve problems involving unknown lengths in geometric figures that contain right angled triangles.

Commented [DSk1]: Does CAPS has this skill?

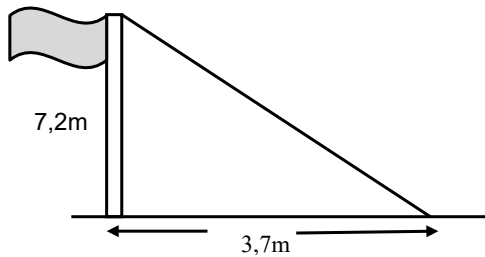
3. RESOURCES:	Sasol-Inzalo books, DBE workbooks, textbook
4. PRIOR KNOWLEDGE:	Theorem of Pythagoras
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic 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 : 5 Minutes)

Begin the lesson by asking learners to make a diagrammatic representation of a ladder leaning diagonally against a wall. Choose three learners to show their drawings on the board. Discuss these drawings with learners and explain to them in this lesson they will be required where necessary to make diagrammatic from problems that will be presented to them.

7. LESSON PRESENTATION/DEVELOPMENT(Suggested time: 20 minutes)	
Teaching activities	Learning Activities (Learners are expected to:)
<p>Use the following example to demonstrate the process of solving a problem.</p> <p>Example 1</p> <p>One end of the rope is tied to the top of the vertical flagpole of height 72 m. When the rope is pulled tight, the other end is 37 m from the base of the flagpole.</p> <p>Calculate the length of the rope. Give your answer correct to 1 decimal place.</p> <p>NB: The following is an illustration of how problem solving questions can be tackled.</p> <p>Step 1: Read the problem with understanding.</p> <ul style="list-style-type: none"> • Read to learners • Allow learners to read alone • Underline key or important words • Understand the question • Ask learners to use their own words to describe their understanding of the problem and question. <p>Step 2: Make a plan.</p> <ul style="list-style-type: none"> • Ask learners to illustrate/show the problem diagrammatically if possible. 	<p>Follow the problem solving process to solve the problem.</p> <p>Share their solutions with the whole class follow the problem solving process to solve the problem</p>

Commented [DSk2]: I think we use a comma not dot.



- Plan a strategy on how to *answer* the question.
- In this case the Theorem of Pythagoras ($a^2 + b^2 = c^2$)

Step 3 : Apply the strategy

- Use the Theorem of Pythagoras

Solution

Let H be the Hypotenuse

$$\begin{aligned}(H)^2 &= (7,2 \text{ m})^2 + (3,7 \text{ m})^2 \\ &= 51,84 \text{ m}^2 + 13,69 \text{ m}^2 \\ &= 65,53 \text{ m}^2\end{aligned}$$

$$\therefore H = \sqrt{65,53 \text{ m}^2}$$

$$\therefore H = 8,1 \text{ m correct to 1 decimal place}$$

Step 4: Verify the answer

- read the question again to check whether the question was correctly answered
- substitute the answer in the original equation

$$\begin{aligned}(H)^2 &= (7,2 \text{ m})^2 + (3,7 \text{ m})^2 \\ (8,1 \text{ m})^2 &= 51,84 \text{ m}^2 + 13,69 \text{ m}^2 \\ 65,61 \text{ m}^2 &\approx 65,53 \text{ m}^2\end{aligned}$$

- Ensure that correct units are used.
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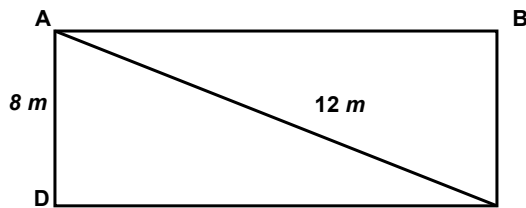
NB: Explain to learners that if the 65,61 and 65,53 are each rounded to the nearest whole number we get the same answer. This confirms that the solution is correct.

Example 2

1. A rectangular lawn is 8 m wide. Mathew walks 12 m diagonally across the lawn from one corner to the other. Once a week Mathew walks along the edges of the lawn from one corner and return to the starting point.

Calculate the total distance he walks around the lawn if he starts at one corner and return to the starting point.

Rough sketch



Solution

$$(AC)^2 = (AB)^2 + (BC)^2$$

$$(AB)^2 = (AC)^2 - (BC)^2$$

$$= (12 \text{ m})^2 - (8 \text{ m})^2$$

$$= 144 \text{ m}^2 - 64 \text{ m}^2$$

$$\therefore AB = \sqrt{80 \text{ m}^2}$$

$AB = 8.94 \text{ m}$ (If the length is given correct to 2 decimal places)

NB: The total distance around the lawn is basically the perimeter of a rectangle.

$$P = 2l + 2b$$

$$= 2(8.94 \text{ m}) + 2(8 \text{ m})$$

$$= 17.88 \text{ m} + 16 \text{ m}$$

$$= 33.8 \text{ m}$$

Mathew will walk a total distance of 33.8 m around the lawn.

- list properties of a rectangle

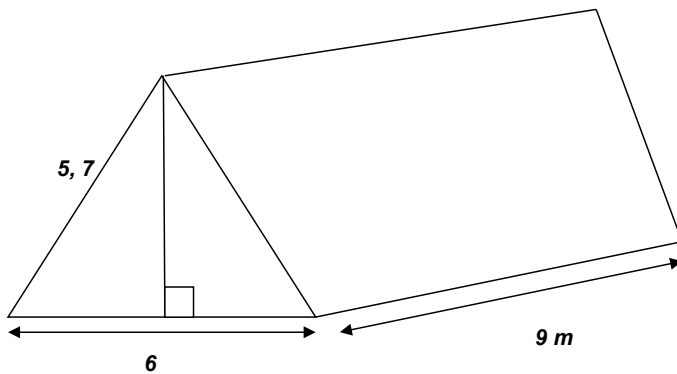
- work individually or in pairs.

8. CLASS WORK (Suggested time 15min)

Carefully choose the exercises which show different cognitive levels from Sasol-Inzalo workbooks, DBE workbooks, ANA question papers and any textbook used in your school. The following are some of the questions that can enhance understanding of the Theorem of Pythagoras.

The following activity must be done by learners individually.

1. A ladder of length 5m is placed at an angle against a wall. The bottom of the ladder is 1m away from the wall. How far up the wall will the ladder reach? Round off the final answer to two decimal places.
2. If the ladder reaches a height of 4,5 m against the wall, how far away from the wall was it placed? Round off to two decimal places.
3. Look at the plan for the roof of a house below.



- a) Work out the height (h) of the supporting beam for the roof, correct to two decimal places
- b) Calculate the area of the whole roof including triangular gables (Upper parts of the wall between the two sloping sides of the roof).

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

(a) Emphasise that:

- the techniques needed for calculating the missing length in a right triangle focussing on context problems. e.g. Learners must be able to correctly identify the hypotenuse on their rough sketches.

(b) Homework

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 workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.