

**Subject:** Mathematics

**Topic:** Quadratic Equation

**Level:** S4

**Learning objective:**

At the end of this activity, students will be able to:

1. describe orally the relationship between the sign of the discriminant and the number of roots in a quadratic equation by using the following sentence pattern to indicate a reason.

Since the discriminant is greater than zero, the equation has two distinct real roots.

1. Content:

Activity 1

Calculations

Answering questions in complete sentences

Oral work

2. Language:

Speaking (This activity will be conducted during at the third lesson of the unit plan.)

The teacher models for the students how to use the language feature 'since' to signal a reason

**S.4 Mathematics**  
**Quadratic Equation**  
**Worksheet 1**

Name: \_\_\_\_\_ Class no: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

**Instruction:**

1. In questions 1, 3 and 5, "Student A" presents the answer orally to "Student B.
2. In questions 2, 4 and 6, "Student B" presents the answer orally to "Student A. .
3. Before you begin the oral presentation is started, please complete the calculations and have your answers ready.

- 1 Find the number of roots in the equation

$$x^2 + 3x + 1 = 0.$$

*Hint: Since the discriminant \_\_\_\_\_ zero,*  
*the equation has \_\_\_\_\_.*

2. Find the number of roots in the equation

$$x^2 + 6x + 9 = 0.$$

*Hint: Since the discriminant \_\_\_\_\_ zero, the equation has \_\_\_\_\_.*

3. Find the number of roots in the equation

$$x^2 + 2x + 5 = 0.$$

*Hint: Since \_\_\_\_\_ , \_\_\_\_\_.*

4. Find the number of roots in the equation

$$x^2 + X + 3 = 0 .$$

*Hint: Since \_\_\_\_\_ , \_\_\_\_\_.*

5. Find the number of roots in the equation

$$x^2 + 4x + 4 == 0$$

\_\_\_\_\_.

6. Find the number of roots in the equation

$$x^2 + 4x + 1 = 0$$

\_\_\_\_\_.

**Subject:** Mathematics

**Topic:** Quadratic Equations

**Level:** S4

**Learning objectives:**

1. Content:

Activity 2

Calculations

2. Language:

Oral work

Answering questions using complete sentences

Information Transfer to signal a cause and effect

Focus of the activity: *Writing*

*(This activity will complete all the lessons in this unit)*

Students should be able to describe the relationship between the sign of the discriminant and the number of **x-intercepts** of a quadratic graph using the signaling language ‘since’ as modeled in the following sentences to show a cause and effect.

- > Since the discriminant is greater than zero, the graph has two **x-intercepts**.
- > Since the graph touches the **x-axis**, the discriminant is equal to zero.
- > Since ... ,... .

This is a writing activity and it will be conducted in the last ten minutes of the lesson. The Teacher will ask the students to **finish** the worksheets after the demonstration.

Before distributing the worksheets to the students, the teacher will model the use of the signalling language in sentence form on the black board. Students will then be asked to use complete sentences to finish their worksheets based on the pattern provided in questions 1 and 4. They will be given 5 minutes to do that. After they have finished this task, teacher will check the answers with the whole class.

**S.4 Mathematics**  
**Quadratic Equation**  
**Worksheet 2**

Name: \_\_\_\_\_ Class no: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_



**Instructions:**

1. Complete question 1 and use this pattern to answer question 3.
2. Complete question 4 and use this pattern to answer question 6.

1. Find the number of **x-intercepts** of the graph  $y = x^2 + 6x - 1$ .

Solution:

Since the discriminant \_\_\_\_\_ zero, the graph has **no /one/two**\* (Please circle -where appropriate) x-intercept(s).

2. Find the number of x-intercepts of the graph  $y = x^2 + 6x - 1$ .

Solution:

Since \_\_\_\_\_, the graph has \_\_\_\_\_ x-intercept(s).

3. Find the number of x-intercepts of the graph  $y = x^2 + 6x - 1$ ,

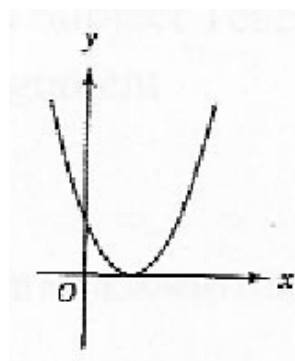
Solution:

\_\_\_\_\_

4. Determine the sign of the discriminant for the given graph.

Solution:

Since the graph does not intercept with the x-axis / touches the x-axis / cuts the x-axis at two distinct points" (Please circle where appropriate), the discriminant \_\_\_\_\_ zero.

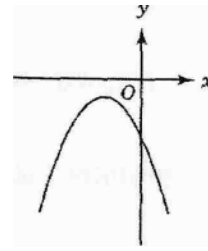


5. Determine the sign of the discriminant for the given graph.

Solution:

Since the graph \_\_\_\_\_,

the discriminant \_\_\_\_\_.



6. Determine the sign of the discriminant for the given graph.

Solution:

\_\_\_\_\_.

\_\_\_\_\_.

