

Teachers' Guide for Fence Your Equation

This lesson takes about 50 minutes. The earlier shot of this video shows a situation at a sheep farm. The video is then focusing on a man getting out of a car and then walking towards the owner of the farm. Using hand signals and body language, he shows that he wants to buy a flock of sheep. The owner nods as a sign of agree. Then, the man pays for the sheep to the owner and they shake hands. The video ends by showing the man returns to his car and drives away. The video will be followed by explaining the concept of differentiation to find the maximum area.

Learning Outcomes/Objectives:

At the end of the lesson, students should be able to:

1. apply the concept of differentiation to find the maximum area
2. apply the concept of differentiation in daily life activities

Prerequisites:

Before watching this video, student should have prior knowledge on:

1. how to differentiate a function
2. how to draw graphs
3. how to find area and volume of various shapes

Suggested activities:

1. We would like to suggest some activities. For instance, teacher can use any shape of pen in doing the activity. And as for activity 2 and 3, you may want to encourage your students to use open source software such as spreadsheet. You can download the software from:

<https://www.openoffice.org/download/index.html>

2. You may want to also provide hand-outs for your students so that they will have clear instructions and guidance on using the software. Please refer to this link to download a copy of the handouts:

http://www.openoffice.org/documentation/manuals/oooauthors/Creating_Charts_Graphs.pdf

ACTIVITY 1 (5 minutes)

1. Students will be assigned to work in small groups.
2. Each group will be given a piece of grid/graph paper.
3. Teacher will draw a diagram of the rectangular with 3 sides on blackboard or whiteboard or plain paper for students' reference.
4. Students will be asked to draw a rectangular with only 3 sides with perimeter 25 metre on the provided grid paper with scale 1 centimetre by 1 metre (1cm: 1m).

5. Teacher will ask students to draw another side of the rectangular to make it enclosed.
6. Students will be asked to calculate the areas of the rectangular.
7. Teacher will ask one or two groups to briefly explain their idea.
8. Teacher then continues to view the second segment of the video.

ACTIVITY 2 (5 minutes)

1. Teacher will provide a hand-out as in Appendix A for each group.
2. In groups, students try to complete the table in the provided hand out.
3. Teacher will ask each group to state the maximum area of the pen.
4. Teacher asks students to justify their answers.
5. Teacher then continues to view the third segment of the video.

ACTIVITY 3 (5 minutes)

1. Teacher will provide a grid/graph paper to each group.
2. Teacher asks students to draw the quadratic graph based on the value in the table that they get from the previous activity.
3. Students will be asked to present their graphs and find the maximum value from the graphs.
4. Teacher then continues to view the fourth segment of the video.

ACTIVITY 4 (5 minutes)

1. Students have to find the derivative of the second equation.
2. Students need to find the value of x and Maximum Area for the second equation.
3. Teacher asks students to compare the value of maximum area for both equations.
4. Teacher continues to view the fifth segment of the video.

ACTIVITY 5 (10 minutes)

1. Teacher will provide a hand-out as in Appendix B to each group.
2. Teacher asks students to derive the area as a function of x of an isosceles triangle whose base against the wall is x .
3. Students are asked to find the area of an isosceles triangle by using 25m wire mesh using the trial and error method.
4. Students are asked to find the value of x such that the area of the isosceles triangle is maximized.
5. Teacher asks students to find the answer using differentiation method.
6. Students are provided with a hand-out as in Appendix C right before teacher views the sixth segment of the video.