

## Max area, fixed perimeter (the famous problem)

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### Activity overview

The student will use a rectangle of fixed perimeter to find the dimensions of the rectangle of maximum area.

### Concepts

Perimeter, area, quadratic regression, maximum

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### Teacher preparation

Instruction that precedes this lesson must include discussion and practice with quadratics and regression from data. The skill of data capture may be previously introduced, or introduced at this time.

### Classroom management tips

### TI-Nspire Applications

Graphs and Geometry, Calculator, Spreadsheet

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### Step-by-step directions

See student handout. Have each student begin by using the `randInt(` command, and picking a number between 10 and 50 (or something reasonable) for their fixed perimeter. This will randomize the results, but students can still work together and help each other.

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### Assessment and evaluation

Students' documents provide either formative or summative assessment data for the teacher. A similar problem can be given later and students asked to solve on their own.

### Activity extensions

- *Use different shapes for the perimeter part of the problem, but continue to maximize volume*
  - *Have students build their shapes of maximum volume and create a nice diagram or 3-D display*
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### Student TI-Nspire Document

*Maxarea\_instructions*