

The pricing plan of a t-shirt company embodies the important mathematical concepts of constant (y-intercept) and rate of change (slope) that are foundational to students' understanding of linear functions.

The task is at the appropriate level of difficulty for students who are in the process of transition between arithmetic and algebra.

## Custom T - Shirts



Last summer you were hired to work at Custom T-Shirts, the company that prints the t-shirts for all of the neighborhood sports teams. When a customer orders shirts with their own design printed on them, Custom T-Shirts charges them a one-time fee of \$15 to make the design plus \$8 for each t-shirt printed.

1. Your first responsibility at Custom T-Shirts is to make a table and a graph that show how much a customer will be charged for various numbers of shirts. Include the cost of up to 100 shirts.
2. How much should Custom T-Shirts charge a customer for 150 shirts? How much should they charge for 750 shirts? Explain how you determined your answers.
3. If you have not done so already, write an equation that could be used to determine how much to charge a customer for any number of shirts.
4. What is the largest number of custom t-shirts that a customer can buy for \$100? Explain how you figured this out.

The four prompts provide entry points for students as they build upon their understanding of arithmetic processes and generalize from these procedures to build their algebraic representations.

Students construct tables, graphs and equations, and will work to connect the various representations as they construct their explanations and listen to their peers' ideas.

### Homework:

- Fancy T-Shirts charges a one-time fee of \$18 to make the design plus \$5 for each t-shirt printed. How will their prices compare to the Custom T-Shirt prices? Explain.

**Task:** "Custom T-Shirts"  
**Source:** Adapted from "1.8 – U.S. Shirts: Using Tables, Graphs, and Equations, Part 1," Cognitive Tutor Algebra 1, p. 37.

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The homework provides an opportunity for students to continue to think about the mathematical ideas that were the focus of this task and to begin to think about the roles of the constant and the coefficient in different representations of a linear function.

While the prompts help students organize their work, they do not give a the solution paths -- students still must make sense of mathematical ideas for themselves.