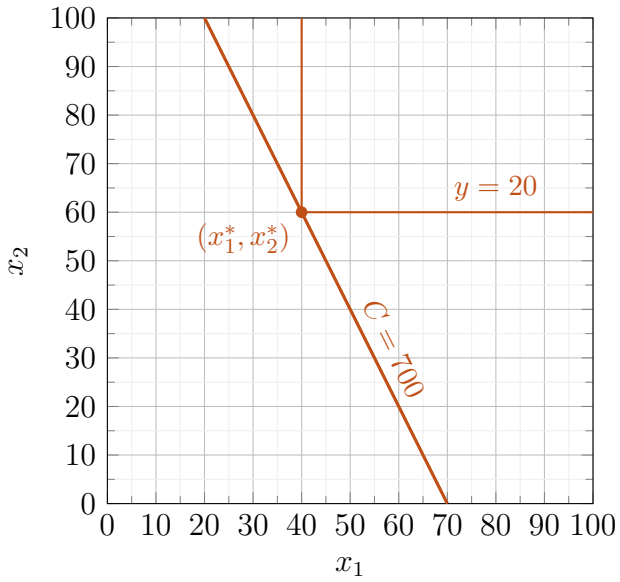
Quiz 11 - SOLUTION

Attila is back. Again. And now he tries to minimize production costs.

Recall that Attila's factory is able to produce each unit of output, y, by combining two units of x_1 with three units of x_2. That is, Attila uses two inputs in fixed proportions.

As for prices, the output is sold at a unit price $p = 1000$, while each unit of x_1 costs $w_1 = 10$ and each unit of x_2 costs $w_2 = 5$.

- In the graph below, draw the isoquant showing the combinations of input that give exactly twenty units of output.



- Write the mathematical formula that describes Attila's technology.

  $y = F(x_1, x_2) = \min\{\frac{1}{2}x_1; \frac{1}{3}x_2\}$

- Assume that Attila's goal is to produce exactly twenty units of output, and he would like to do that in the least costly way. How many units of input should he be using?

  $x_1^*(y = 20) = 40$ $\qquad$ $x_2^*(y = 20) = 60$

- Write the general mathematical formula that describes Attila's isocost lines. C denotes the firm's cost level.

  $x_2(C, w_1, w_2, x_1) = \frac{C}{w_2} - \frac{w_1}{w_2}x_1$

- How much does it cost to produce twenty units of output in Attila's factory if costs are minimized?

  $c(y = 20) = w_1 \cdot x_1^* + w_2 \cdot x_2^* = 10 \cdot 40 + 5 \cdot 60 = 700$

- In the graph above, draw the isocost line that corresponds to the minimum cost of producing twenty units of output. $(x_2 = \frac{700}{5} - \frac{10}{5}x_1 = 140 - 2x_1)$