Practice Task: Lucy's Linear Equations and Inequalities

Lucy has been assigned the following linear equations and inequality word problems. Help her solve each problem below by using a five step plan:

- Drawing a Sketch (if necessary)
- Defining a Variable
- Setting up an equation or inequality
- Solve the equation or inequality
- Make sure you answer the question

1. The sum of 38 and twice a number is 124. Find the number.

   Define a variable: \( x = \) the number

   Equation: \( 38 + 2x = 124 \)

   \[ 2x = 86 \]

   \[ x = 43 \]

2. The sum of two consecutive integers is less than 83. Find the pair of integers with the greatest sum.

   Define a variable: \( x = \) the 1st consecutive #

   So \( x+1 = \) and consecutive #

   Equation: \( x + x+1 < 83 \)

   \[ x < 41 \]

3. A rectangle is 12m longer than it is wide. Its perimeter is 68m. Find its length and width.

   \[ \begin{align*}
   \text{Width:} & \quad w \\
   \text{Length:} & \quad w+12
   \end{align*} \]

   Equation: \( w + w + (w+12) + (w+12) = 68 \)

   \[ 4w + 24 = 68 \]

   \[ 4w = 44 \]

   \[ w = 11 \]

   \[ \text{Width:} \quad 11 \\
   \text{Length:} \quad 23 \]

4. The length of a rectangle is 4 cm more than the width and the perimeter is at least 48 cm. What are the smallest possible dimensions for the rectangle?

   \[ \begin{align*}
   \text{Width:} & \quad w \\
   \text{Length:} & \quad w+4
   \end{align*} \]

   Equation: \( w + w + w+4 + w+4 \geq 48 \)

   \[ 4w \geq 40 \]

   \[ w \geq 10 \]

   \[ \text{Width:} \quad 10 \\
   \text{Length:} \quad 14 \]