3. a. Solve $|x - 2| < 3$ algebraically (Show Work!).
   1st way: $|x - 2| < 3$
   
   $-3 < x - 2 < 3$
   
   $-1 < x < 5$

   2nd way:
   $x - 2 < 3 \text{ and } -(x - 2) < 3$
   
   $x < 5 \text{ and } x > -1$
   
   $-1 < x < 5$

   b. Illustrate the solutions to the given inequality on the number line (label relevant points.)

   (Number line)

   c. Using your own words, explain what it means to solve $|x - 2| < 3$ and explain how the solutions you found in parts a and b above are related.

   **FIND ALL VALUES THAT ARE LESS THAN 3 UNITS AWAY FROM 2 ON THE NUMBER LINE**

4. A box with a square base and open top must have a volume of 32,000 cm³.
   a. Express the surface areas of the box as a function of the length of a side of the base, b.
      
      \[ V = b^2 h = 32,000 \]
      \[ S.A. = b^2 + 4 \left( \frac{32,000}{b^2} \right) b \]
      \[ h = \frac{32,000}{b^2} \]
      \[ S.A. = b^2 + \frac{128,000}{b} \]

   b. Use your graphing calculator to construct a graph of this function. Sketch this graph below. Label three points on your graph and explain what they represent.

   ![Graph](image)

   Point (40, 900) represents the minimized surface area (material used).

   c. Find the dimensions of the box that minimize the amount of material used. (You may use your graphing calculator to assist you.) Explain your procedure and the rationale for your solution.

   Using graph above, and \( h \) in part a.

   Dimensions of box = \( 40 \times 40 \times \frac{32,000}{(40)^2} \)

   \[ I = 40 \times 40 \times 20 \]

   **I am resigning to verify that I did NOT consult another person when completing this exam.**

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