2. A has 40 kg mass  
   B has 33 kg mass  
   plank has 22 kg mass  
   
   The center of mass of system must be on the fulcrum (stone). Easiest way:  
   take left end to be reference, then  
   
   \[ r_{cm} = \frac{0(40 \text{ kg}) + (22 \text{ kg})(3 \text{ m}) + (33 \text{ kg})(6 \text{ m})}{40 + 33 + 22} \]  
   
   \[ = 2.78 \text{ m} \]  
   
   So placing stone 2.78 meters from kid  
   A will balance system!  
   
   More difficult way suggested in session.  
   take fulcrum to be origin:  
   
   \[ \frac{A \times x}{1} \frac{6-x}{B} \]
   
   then
\[ \overrightarrow{F}_{em} = 0 = \left(-x\right)(40 \text{ kg}) + (6-x)(33 \text{ kg}) + (3-x)(22 \text{ kg}) \]
\[ \frac{40 + 22 + 33}{40 + 22 + 33} \]

\[ 0 = -40x + (6 \cdot 33) - 33x + (3 \cdot 22) - 22x \]

\[ 264 - 95x = 0 \]

\[ x = 2.78 \]

Same answer is great!