36. Let c be the number of children and a be the number of adults. This gives

$$\begin{array}{rrcrl} c+a=2200 & \times -3 & & -3c-3a=-6600 & \\ 1.50c+4.00a=5050 & \times 2 & \Rightarrow & 3c+8a=10100 & \\ & & & \hline 5a=3500 & \Leftrightarrow \quad a=700. \end{array}$$

So $c+700=2200 \quad \Leftrightarrow \quad c=1500$. Therefore, the number of children admitted was 1500 and the number of adults was 700.

38. Let x be speed of the boat in still water and y be speed of the river flow.

$$\begin{array}{rrcrl} \text{Down river:} & x+y=20 & \times 5 & 5x+5y=100 & \\ \text{Up river:} & 2.5x-2.5y=20 & \times 2 & \Rightarrow \quad 5x-5y=40 & \\ & & & \hline 10x \quad =140 & \Leftrightarrow \quad x=14 \end{array}$$

So $14+y=20 \quad \Leftrightarrow \quad y=6$. Therefore, the boat's speed is 14 mph and the current in the river flows at 6 mph.

40. Let x and y be the number of milliliters of the two brine solutions.

$$\begin{array}{rrcrl} \text{Quantity:} & x+y=1000 & \times -1 & -x-y=-1000 & \\ \text{Concentrations:} & 0.05x+0.20y=0.14 & \times 20 & \Rightarrow \quad x+4y=2800 & \\ & & & \hline 3y=1800 & \Leftrightarrow \quad y=600 \end{array}$$

So $x+600=1000 \quad \Leftrightarrow \quad x=400$. Therefore, 400 milliliters of the 5% solution and 600 milliliters of the 20% solution should be mixed.

42. Let x be the number of pounds of Kenyan coffee and y be the number of pounds of Sri Lankan coffee. This gives

$$\begin{array}{rrcrl} 3.50x+5.60y=11.55 & \times -10 & & 35x+56y=115.5 & \\ x+y=3 & \times -35 & \Rightarrow & -35x-35y=105 & \\ & & & \hline 21y=10.5 & \Leftrightarrow \quad y=0.5 \end{array}$$

So $x+(2.5)=3 \quad \Leftrightarrow \quad x=2.5$. Thus, 2.5 pounds of Kenyan coffee and 0.5 pounds of Sri Lankan coffee should be mixed.

44. Let x be the amount she invests at 5% and let y be the amount she invests at 8%.