1. Suppose that each small pumpkin weighs 5 kg, each medium pumpkin weighs 7 kg, and each large pumpkin weighs 8 kg.
Then the total mass of one small pumpkin and one medium pumpkin is 5 kg + 7 kg = 12 kg.
Also, the total mass of one small pumpkin and one large pumpkin is 5 kg + 8 kg = 13 kg.
Further, the total mass of one medium pumpkin and one large pumpkin is 7 kg + 8 kg = 15 kg.
These are the correct totals.

2. No solution.

3. (a) Try drawing pictures that show the desks being added as you follow through this solution.
When the first two desks are put on the scale, the scale reads 47 kg.
When the next two desks are put on the scale, the scale reads 47 kg + 80 kg.
When the final two desks are put on the scale, the scale reads 47 kg + 80 kg + 91 kg.
Therefore, the total mass of the six desks is 47 kg + 80 kg + 91 kg = 218 kg.
(b) The six desks that have a total mass of 218 kg include two small desks, two medium desks, and two large desks.
When these desks are divided into equal groups of one small desk, one medium desk, and one large desk each, the mass of each group is identical, and equals $(218 \text{ kg}) \div 2 = 109 \text{ kg}$.
(c) Since the total mass of one small desk, one medium desk, and one large desk is 109 kg, and the total mass of one small desk and one medium desk is 47 kg, then the mass of one large desk is $109 \text{ kg} - 47 \text{ kg} = 62 \text{ kg}$. (Imagine having the three desks on the scale and removing the two that you don’t want.)
Since the mass of one large desk is 62 kg and the total mass of one small and one large desk together is 80 kg, then the mass of one small desk is $80 \text{ kg} - 62 \text{ kg} = 18 \text{ kg}$.
Since the mass of one large desk is 62 kg and the total mass of one medium and one large desk together is 91 kg, then the mass of one medium desk is $91 \text{ kg} - 62 \text{ kg} = 29 \text{ kg}$.
Therefore, the mass of each small desk is 18 kg, the mass of each medium desk is 29 kg, and the mass of each large desk is 62 kg.

**Extension**

Try following the steps given in 3. to solve this problem with larger answers.
If you do this, you should find that the total mass of the six elephants is 27 480 kg.
This means that the total mass of one small elephant, one medium elephant, and one large elephant is 13 740 kg.
Can you use this information to determine the mass of each size of elephant? You can check your answers by combining them to see if they match the given information.