NBA Playing TIme

Activity: Coach Lue has decided to determine a player's playing time based on average points scored during the playoffs. With a total average of 127.4 points per game, the distribution of average points per player for the 2017 playoffs is as follows.

Player	Frye	Irving	James	Jefferson	D. Jones	J. Jones	Korver
Avg Points	12.8	25.9	32.8	3.9	1.6	0.2	5.8
Player	Love	Shumpert	Smith	Thompson	Dn. Williams	Dk. Williams	
Avg Points	16.8	4.4	8.1	8.2	4.3	2.6	

We wish to use these statistics to allocate minutes per game.

1. In order to keep all players happy every player must play a minimum of 12 minutes per game. Use your favorite apportionment method to allocate playing time in a 48 minute game. Recall, five players play at a time, so this is equivalent to allocating 240 minutes of playing time where 156 minutes are automatically allocated by the restriction.

2. Suppose the coach decides to allocate playing time based on the match-up with the opposing team. This week he expects the game to be close, so only players scoring an average of 5 points or higher will play in the game.

   (a) Use your apportionment method to allocate playing time among the seven players whose average points were 5 or higher. Do you notice a problem?

   (b) Modify your apportionment method to cap the minutes played at 48 minutes a game for an individual player. Hint: If a player was allocated above 48 minutes in part (a), set his minutes to 48, remove him from the calculation and redo the apportionment.

3. Would you want to use a modified method such as you used in question 2, with an upper limit on the number of representatives, to apportion a house of representatives? Can you think of another situation where such an upper limit is appropriate?