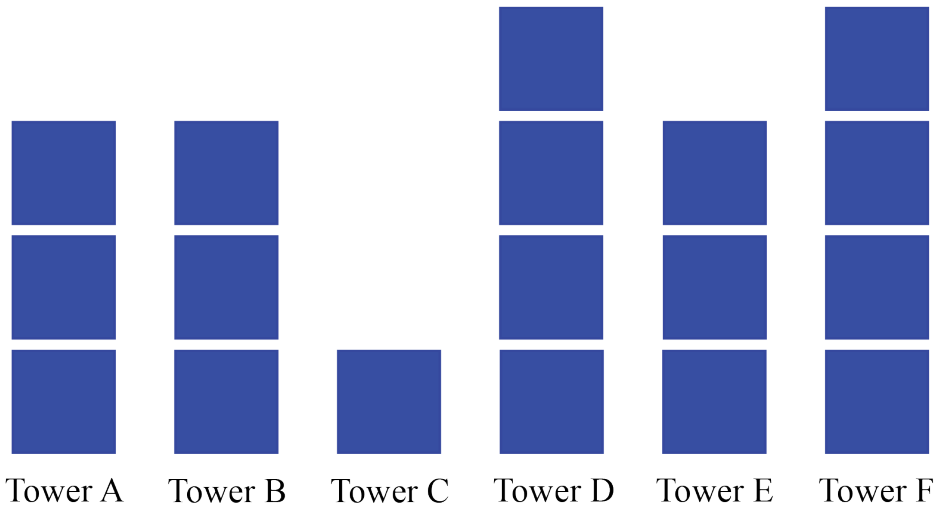
Problem of the Week
Problem B and Solution
Means à la Mode

Problem

Octavia has a large bin of blocks. Using 18 blue blocks she makes exactly six towers. The height of the tower is the total number of blocks used in that tower.



(a) Determine the mean, the median, and the mode of the heights of the towers made by Octavia.

(b) Create a different set of six towers using 18 blocks where the mean height is greater than the mode height.

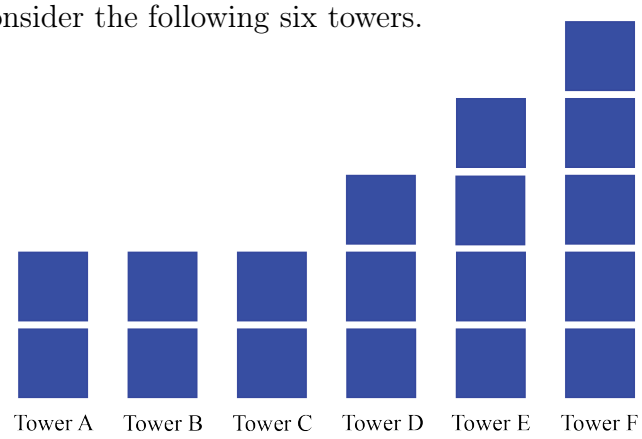
(c) Create a different set of six towers using 18 blocks where the mean height is greater than the median height.

(d) Create a different set of six towers using 18 blocks where the median height is greater than the mean height.

Solution

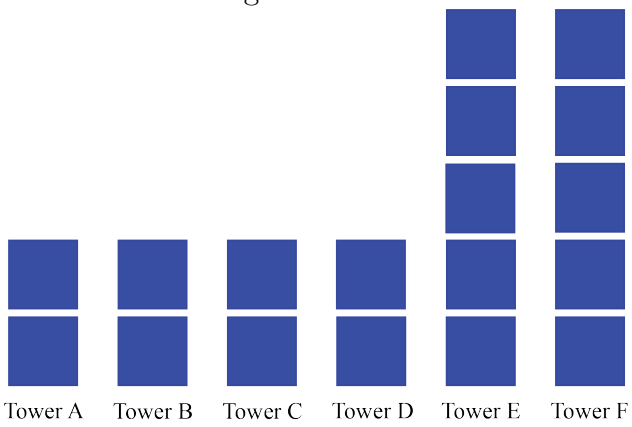
(a) Written in increasing order, the tower heights are 1, 3, 3, 3, 4, 4. Thus the mode is 3, the median is $(3+3) \div 2 = 3$, and the mean is $(1+3+3+3+4+4) \div 6 = 3$.

(b) Answers will vary. Consider the following six towers.



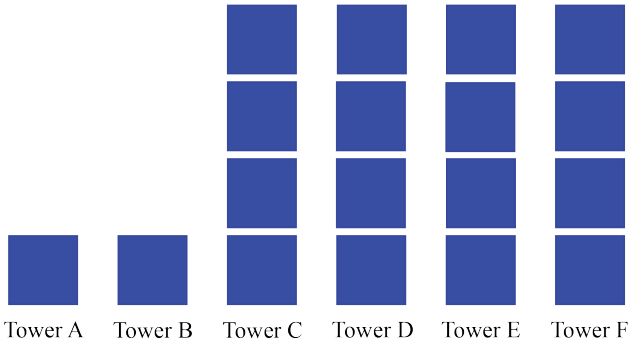
The tower heights are 2, 2, 2, 3, 4, 5. The mode is 2 and the mean is $(2+2+2+3+4+5) \div 6 = 3$. Thus, the mean is greater than the mode.

(c) Answers will vary. Consider the following six towers.



The tower heights are 2, 2, 2, 2, 5, 5. The median is $(2+2) \div 2 = 2$ and the mean is $(2+2+2+2+5+5) \div 6 = 3$. Thus, the mean is greater than the median.

(d) Answers will vary. Consider the following six towers.



The tower heights are 1, 1, 4, 4, 4, 4. The median is $(4+4) \div 2 = 4$, and the mean is $(1+1+4+4+4+4) \div 6 = 3$. Thus, the median is greater than the mean.