

10mm Squares

M, M & M solutions & explanations =

Numbers: 1st  $n_1$ , 2nd  $n_2$ , 3rd  $n_3$ , 4th  $n_4$ , 5th  $n_5$   
 (1) Mean of 5 numbers is 4 (means) that total sum of 5 numbers =  $5 \times 4 = 20$   
 (2) Median = 3  
 (3) Mode = 3

Total Sum = 20				
		3		

Possibility 1

$n_1$	3	3	$n_4$	$n_5$
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Conditions:  
 (1)  $n_1 < 3$   
 (2)  $n_4, n_5 > 3$   
 (3)  $n_1 + n_4 + n_5 = 20 - 3 \times 2 = 14$

For  $n_1 < 3$   
 Possible Option:  
 (1)  $n_1 = 1$   
 $n_4 + n_5 = 14 - 1 = 13$   
 Combination of  $n_4, n_5$

$n_1$	$n_2$	$n_3$	$n_4$	$n_5$
1	3	3	6	7
1	3	3	5	8
1	3	3	4	9

(2)  $n_1 = 2$   
 $n_4 + n_5 = 14 - 2 = 12$   

$n_1$	$n_2$	$n_3$	$n_4$	$n_5$
2	3	3	5	7
2	3	3	4	8

Possibility 2

$n_1$	$n_2$	3	3	$n_5$
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Conditions:  
 (1)  $n_1, n_2 < 3$   
 (2)  $n_5 > 3$   
 (3)  $n_1 + n_2 + n_5 = 20 - 6 = 14$   
 For  $n_1 = 1$  and  $n_2 = 1$

1	1	3	3	12
NOT POSSIBLE because there are 2 modes				
1	2	3	3	11

2	2	3	3	10
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Possibility 3

3	3	3	$n_4$	$n_5$
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Conditions:  
 (1)  $n_4$  and  $n_5 > 3$   
 (2)  $n_4 + n_5 = 20 - 9 = 11$   
 Combinations of  $n_4$  and  $n_5$

3	3	3	4	7
3	3	3	5	6

Possibility 4

$n_1$	3	3	3	$n_5$
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Conditions:  
 (1)  $n_1 < 3$   
 (2)  $n_5 > 3$   
 (3)  $n_1 + n_5 = 20 - 9 = 11$

Combinations

1	3	3	3	10
2	3	3	3	9

Possibility 5

3	3	3	3	$n_5$
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Conditions:  
 (1)  $n_5 > 3$   
 (2)  $n_5 = 20 - 12 = 8$

3	3	3	3	8
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Conclusion

I have found 13 different combinations where the mean is 4, the mode is 3 and the median is 3 in a set of 5 numbers.

Ci Hui Minh Ngoc Ong Queensland Academies for Science  
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