

21. The possible scores for each time a game is played are 1, 2, 3 or 4.

<b>Score</b>	1	2	3	4
<b>Frequency</b>	$x - 1$	$x$	$x - 5$	$x - 3$

- (a) Calculate the value of  $x$  if the mode, median and mean scores are the same.  
 (b) How many times was the game played?  
 (c) The score was repeatedly 4 for the next  $n$  games. Find the minimum value of  $n$  for the mode to be 4.

**Solution:**

- (a) Mode = 2

$$\begin{aligned} \text{Mean} &= \frac{x - 1 + 2x + 3(x - 5) + 4(x - 3)}{x - 1 + x + x - 5 + x - 3} \\ &= \frac{x - 1 + 2x + 3x - 15 + 4x - 12}{4x - 9} \\ &= \frac{10x - 28}{4x - 9} \end{aligned}$$

$$\therefore \frac{10x - 28}{4x - 9} = 2$$

$$10x - 28 = 8x - 18$$

$$2x = 10$$

$$x = 5$$

- (b) Number of times the game was played =  $4(5) - 9$   
 $= 11$

- (c) Minimum value of  $n = x - (x - 3) + 1$   
 $= 3 + 1$   
 $= 4$

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