

# Solution 246

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It may look complicated, but this is an easy problem. First, J-1 will be calculated by using a weighted average of bench marks BM-1, BM-2 and BM-3. Second, J-2 will be calculated by using a weighted mean of BM-4, BM-5 and BM-6. Finally, J-1 and J-2 will be adjusted using the equivalent weighted means and the tie between them.

$$\text{BM-1 to J-1: } (531.331 + 3.675) \cdot \frac{1}{43} = 12.44200$$

$$\text{BM-2 to J-1: } (476.705 + 58.464) \cdot \frac{1}{37} = 14.46403$$

$$\text{BM-3 to J-1: } (457.890 + 77.083) \cdot \frac{1}{23} = \underline{23.25970}$$

$$\text{The temporary elevation of J-1} = \sum = 50.16573 \cdot \frac{1}{\frac{1}{43} + \frac{1}{37} + \frac{1}{23}} = 535.0378$$

$$\text{BM-4 to J-2: } (477.985 + 46.949) \cdot \frac{1}{31} = 16.93335$$

$$\text{BM-5 to J-2: } (507.072 + 18.009) \cdot \frac{1}{41} = 12.80685$$

$$\text{BM-6 to J-2: } (493.044 + 31.922) \cdot \frac{1}{39} = \underline{13.46067}$$

$$\text{The temporary elevation of J-2} = \sum = 43.20087 \cdot \frac{1}{\frac{1}{31} + \frac{1}{41} + \frac{1}{39}} = 524.9875$$

$$\frac{1}{\frac{1}{43} + \frac{1}{37} + \frac{1}{23}} \text{ is equivalent to } 10.6654 \text{ turns and } \frac{1}{\frac{1}{31} + \frac{1}{41} + \frac{1}{39}} \text{ is } 12.1522 \text{ turns}$$

Using BM-2:.....	476.7050	(zeroes added as place holders).....	476.7050
535.0378 - 476.705 =	<u>+58.3328</u>	(10.6654 turns), 58.3328 + 0.0230.....	<u>+58.3558</u>
J-1.....	535.0378.....		535.0608
	-10.1620	(29 turns), -10.1620 + 0.0625.....	<u>-10.0995</u>
J-2.....	524.8758.....		524.9613
507.072 - 524.9875 =	<u>-17.9155</u>	(12.1522 turns), -17.9155 + 0.0262.....	<u>-17.8893</u>
BM-5.....	506.9603.....		507.0720
	(507.072)		
correction:.....	+0.1117	(51.8176 turns) = 0.00215564 per turn	

[A Starlev© solution yields J-1=535.0607 and J-2=524.9613].