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11 a) $\vec{OD} = \vec{OA} + \vec{BC} = \begin{pmatrix}1\\2\\3\end{pmatrix} + \begin{pmatrix}4-2\\8-5\\6-3\end{pmatrix} = \begin{pmatrix}1\\2\\3\end{pmatrix} + \begin{pmatrix}2\\3\\3\end{pmatrix} = \begin{pmatrix}3\\5\\6\end{pmatrix}$

$D(3|5|6)$ $M_{AC}\left(\frac{1+4}{2} \mid \frac{2+8}{2} \mid \frac{3+6}{2}\right) = (2{,}5 \mid 5 \mid 4{,}5)$

$C(1|5|6)$

b) $\frac{a_1+1}{2} = 5$; $\frac{a_2+5}{2} = 6$; $\frac{a_3+6}{2} = 2$ $M_{AC}(5|6|2)$

$a_1 = 2\cdot 5 - 1 = 9$; $a_2 = 2\cdot 6 - 5 = 7$; $a_3 = 2\cdot 2 - 6 = -2$

$A(9|7|-2)$

$\frac{d_1+3}{2} = 5$; $\frac{d_2+9}{2} = 6$; $\frac{d_3+2}{2} = 2$ $B(3|9|2)$ $M_{BD}(5|6|2)$

$d_1 = 2\cdot 5 - 3 = 7$; $d_2 = 2\cdot 6 - 9 = 3$; $d_3 = 2\cdot 2 - 2 = 2$

$D(7|3|2)$

c) $\vec{OC} = \vec{OA} + 2\cdot\vec{AM} = \begin{pmatrix}3\\3\\6\end{pmatrix} + 2\cdot\begin{pmatrix}8-3\\1-3\\2-6\end{pmatrix} = \begin{pmatrix}3\\3\\6\end{pmatrix} + \begin{pmatrix}10\\-4\\-8\end{pmatrix} = \begin{pmatrix}13\\-1\\-2\end{pmatrix}$

$C(13|-1|-2)$

$\vec{OB} = \vec{OD} + 2\cdot\vec{DM} = \begin{pmatrix}5\\-1\\6\end{pmatrix} + 2\begin{pmatrix}8-5\\1-(-1)\\2-6\end{pmatrix} = \begin{pmatrix}5\\-1\\6\end{pmatrix} + \begin{pmatrix}6\\4\\-8\end{pmatrix} = \begin{pmatrix}11\\3\\-2\end{pmatrix}$

$B(11|3|-2)$

d) $\vec{OA} = \vec{OC} + 2\cdot\vec{CM} = \begin{pmatrix}-1\\3\\5\end{pmatrix} + 2\begin{pmatrix}15-(-1)\\3-3\\-2-5\end{pmatrix} = \begin{pmatrix}-1\\3\\5\end{pmatrix} + \begin{pmatrix}32\\0\\-14\end{pmatrix} = \begin{pmatrix}31\\3\\-9\end{pmatrix}$

$A(31|3|-9)$

$\vec{OB} = \vec{OD} + 2\cdot\vec{DM} = \begin{pmatrix}1\\9\\-4\end{pmatrix} + 2\begin{pmatrix}15-1\\3-9\\-2-(-4)\end{pmatrix} = \begin{pmatrix}1\\9\\-4\end{pmatrix} + \begin{pmatrix}28\\-12\\4\end{pmatrix} = \begin{pmatrix}29\\-3\\0\end{pmatrix}$

$B(29|-3|0)$