

Vectors

Answers

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8. (a) $2\mathbf{a} + \mathbf{b} + \mathbf{c}$ (b) $\mathbf{a} + \frac{1}{2}\mathbf{b} + \frac{1}{2}\mathbf{c}$ (c) $-\mathbf{a}$
 (d) $\mathbf{a} + \frac{1}{2}\mathbf{b} - \frac{1}{2}\mathbf{c}$ (e) $\frac{1}{2}(\mathbf{c} - \mathbf{b})$
10. (a) $\frac{1}{3}\mathbf{b} - \mathbf{d}$ (b) $\mathbf{b} + \mathbf{d}$ (c) $\alpha = \beta = 3$
11. $\vec{AQ} = \frac{1}{3}(\mathbf{a} + \mathbf{b})$
12. (a) $\vec{AC} = 2\mathbf{p} + 8\mathbf{q}$
13. (a) (i) $-\mathbf{a} + \frac{1}{2}\mathbf{c}$ (ii) $\mathbf{c} - 2\mathbf{a}$ (b) 1 : 2
14. (a) $\begin{pmatrix} 7 \\ 5 \end{pmatrix}$ (b) $\vec{KH} = \begin{pmatrix} 2.5 \\ 4 \end{pmatrix}$ $\vec{LH} = \begin{pmatrix} -1.5 \\ 4 \end{pmatrix}$
 (c) $\vec{LN} = \begin{pmatrix} -3 \\ 8 \end{pmatrix} = 2\vec{LH}$ so H is the midpoint of LN .
15. (a) $\vec{BD} = 2\mathbf{b} - \mathbf{a}$, $\vec{BX} = \frac{3}{5}(2\mathbf{b} - \mathbf{a})$
 (b) $\vec{XC} = \vec{BC} - \vec{BX} = \mathbf{b} - \frac{3}{5}(2\mathbf{b} - \mathbf{a}) = \frac{1}{5}(3\mathbf{a} - \mathbf{b})$