

习题 5.1

1. 垂直.

2. $5\mathbf{a} - 11\mathbf{b} + 7\mathbf{c}$

3. 证明: 设四边形 $ABCD$ 的对角线 AC, BD 互相平分于点 O , 则 $\overrightarrow{AO} = \overrightarrow{OC}, \overrightarrow{DO} = \overrightarrow{OB}$, 于是 $\overrightarrow{AB} = \overrightarrow{AO} + \overrightarrow{OB} = \overrightarrow{OC} + \overrightarrow{DO} = \overrightarrow{DC}$, 由此可见 $\overrightarrow{AB} // \overrightarrow{DC}$, $|\overrightarrow{AB}| = |\overrightarrow{DC}|$, 因此四边形 $ABCD$ 是平行四边形.

4. $\overrightarrow{D_1A} = -\frac{1}{5}\mathbf{a} - \mathbf{c}, \overrightarrow{D_2A} = -\frac{2}{5}\mathbf{a} - \mathbf{c}, \overrightarrow{D_3A} = -\frac{3}{5}\mathbf{a} - \mathbf{c}, \overrightarrow{D_4A} = -\frac{4}{5}\mathbf{a} - \mathbf{c}.$

5. $\overrightarrow{BC} = \mathbf{a} + \mathbf{b}, \overrightarrow{CD} = \mathbf{b}, \overrightarrow{DE} = \mathbf{a}, \overrightarrow{EF} = -(\mathbf{a} + \mathbf{b}).$