

3.7.1

$$f(\vec{r}_1 + \vec{r}_2) = \vec{A} \cdot (\vec{r}_1 + \vec{r}_2) + 3 = \vec{A} \cdot \vec{r}_1 + \vec{A} \cdot \vec{r}_2 + 3$$

$$f(\vec{r}_1) + f(\vec{r}_2) = (\vec{A} \cdot \vec{r}_1 + 3) + (\vec{A} \cdot \vec{r}_2 + 3) = \vec{A} \cdot \vec{r}_1 + \vec{A} \cdot \vec{r}_2 + 6$$

Non linéaire

3.7.2

$$\begin{aligned} f(\vec{r}_1 + \vec{r}_2) &= \vec{A} \cdot (\vec{r}_1 + \vec{r}_2 - z\vec{k}) = (a_1, a_2, a_3) \cdot (x_1 + x_2, y_1 + y_2, z_1 + z_2 - z) \\ &= a_1(x_1 + x_2) + a_2(y_1 + y_2) + a_3(z_1 + z_2 - z) \end{aligned}$$

$$\begin{aligned} f(\vec{r}_1) + f(\vec{r}_2) &= \vec{A} \cdot (\vec{r}_1 - z\vec{k}) + \vec{A} \cdot (\vec{r}_2 - z\vec{k}) = (a_1, a_2, a_3) \cdot (x_1, y_1, z_1 - z) + (a_1, a_2, a_3) \cdot (x_2, y_2, z_2 - z) \\ &= a_1x_1 + a_2y_1 + a_3(z_1 - z) + a_1x_2 + a_2y_2 + a_3(z_2 - z) \\ &= a_1x_1 + a_1x_2 + a_2y_1 + a_2y_2 + a_3(z_1 - z) + a_3(z_2 - z) \\ &= a_1(x_1 + x_2) + a_2(y_1 + y_2) + a_3(z_1 + z_2 - 2z) \end{aligned}$$