Solutions for Quiz 2, Section A04

Find a such that the vectors $\vec{A} = \langle a, 3, a \rangle$ and $\langle 1, a, a \rangle$ are perpendicular.

Solution: The vectors are perpendicular if and only if their dot product is 0. We compute:

$$\vec{A} \cdot \vec{B} = 0$$
$$a \cdot 1 + 3 \cdot a + a \cdot a = 0$$
$$4a + a^2 = 0$$
$$a(4 + a) = 0$$

Thus, $a = 0$ and $a = -4$ will both make these vectors perpendicular.