Exercise 1

In each of the following case, find whether the given vector is in the span of the set $\{(0, -2, 2), (1, 3, -1)\}$.

1. $(2, 2, 2)$;
2. $(0, 6, -6)$;
3. $(-1, 0, 0)$
4. $(0, 4, 5)$;
5. $(0, 0, 0)$.

Exercise 1: Solution

The given vector is

1. in span;
2. in span;
3. not in span;
4. not in span;
5. in span.

Exercise 2

In each of the following cases, find whether $\vec{u}$, $\vec{v}$ and $\vec{w}$ are linearly independent.

1. $\vec{u} = (2, -2, 0)$, $\vec{v} = (6, 1, 4)$, and $\vec{w} = (2, 0, -4)$;
2. $\vec{u} = (-6, 7, 2)$, $\vec{v} = (3, 2, 4)$, and $\vec{w} = (4, -1, 2)$;
3. $\vec{u} = (1, 0, 0)$, $\vec{v} = (1, 1, 0)$, and $\vec{w} = (1, 1, 1)$;
4. $\vec{u} = (-2, 3, 9)$, $\vec{v} = (0, -5, -5)$, and $\vec{w} = (0, 0, 0)$.

Exercise 2: Solution

The given vectors are

1. linearly independent;
2. linearly dependent;
3. linearly independent;
4. linearly dependent.