Step-1

We have to find that which number *b* leads later to a row exchange, which number *b* leads to a missing pivot, and in that singular case we have to find a non-zero solution x, y, z:

$$x + by = 0$$
$$x - 2y - z = 0$$
$$y + z = 0$$

Step-2

After eliminating first pivot when applying (row2) â€“ (row 1) the second pivot position will contain $-2 - b$

If $b = -2$, we exchange with row 3 since the system is

$$x - 2y = 0$$
$$x - 2y - z = 0$$
$$y + z = 0$$

So we can exchange row 3 if $b = -2$

Step-3

If $b = -1$, the second equation is $-y - z = 0$. And the system is

$$x - y = 0$$
$$x - 2y - z = 0$$
$$y + z = 0$$

Performing (row 2) â€“ (row1) gives

$$x - y = 0$$
$$-y - z = 0$$
$$y + z = 0$$

Step-4

Adding (row 3) + (row 2) give

$$x - y = 0$$
$$-y - z = 0$$

To solving these equations by letting $x = y = 1$, one of the solutions is $(1, 1, -1)$