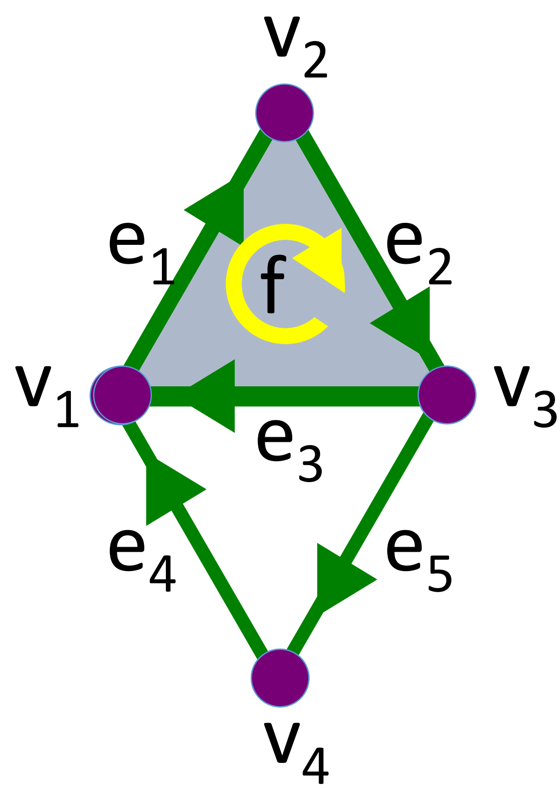
The dimension of f =

The dimension of e_i =

The dimension of v_i =



The boundary of v_i =

The boundary of f =

The boundary of $e_1 = v_2 - v_1$

The boundary of $e_2 = v_3 - v_2$

The boundary of $e_4 = v_1 - v_4$

The boundary of e_5 =

The boundary of $e_1 + e_2$ =

The boundary of $e_1 + e_4$ =

The boundary of $e_1 + e_5$ =

The boundary of $e_1 + e_2 + e_3$ =

The boundary of $e_3 + e_4 + e_5$ =

The boundary of $-e_3 + e_4 + e_5$ =

The boundary of $e_1 + e_2 + e_4 + e_5$ =

Let $X = e_1 + e_2 + e_3$, let $Y = -e_3 + e_4 + e_5$, and let $Z = e_1 + e_2 + e_4 + e_5$. Show that $Z = X + Y$

Answer:

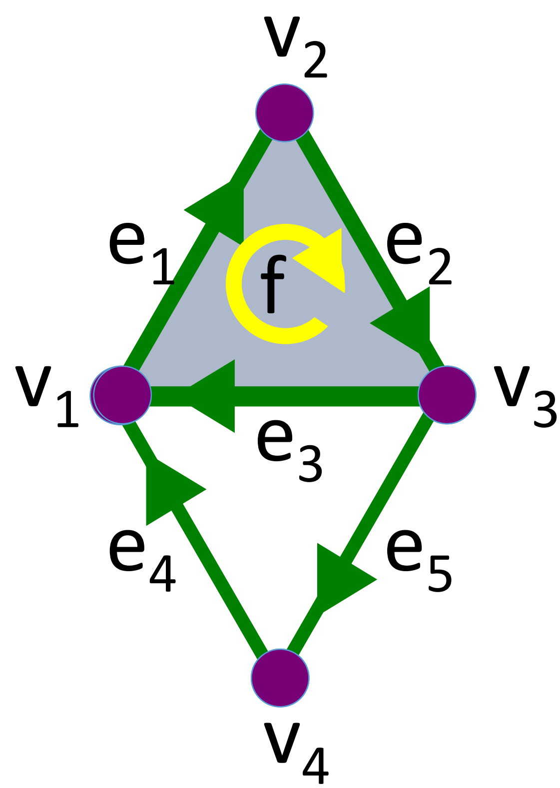
$X + Y = (e_1 + e_2 + e_3) + (-e_3 + e_4 + e_5) = e_1 + e_2 + e_3 - e_3 + e_4 + e_5 = e_1 + e_2 + e_4 + e_5 = Z$

Note z is a cycle if the boundary of z = 0.

List three 1-dimensional cycles:

List four 0-dimensional cycles:

Are there any 2-dimensional cycles



Consider the differences between Z and Z_2:

When working over Z = the set of integers, one does not have multiplicative inverses.

When working over Z_2 = {0, 1}, one has multiplicative inverses.

Also, computationally, Z_2 is much easier to work with.

For the following, we will work over Z_2 = {0, 1}

The boundary of $e_1 + e_2 + e_3$ =

The boundary of $e_3 + e_4 + e_5 = -e_3 + e_4 + e_5$ =

$|C_0|$ = _____, $|C_1|$ = _____, $|C_2|$ = _____, $|C_3|$ = _____

1.) Find C_i, B_i, Z_i

2.) Find the matrix corresponding to each boundary map (from C_i to C_{i-1})

3.) Find H_i