

Figure 1

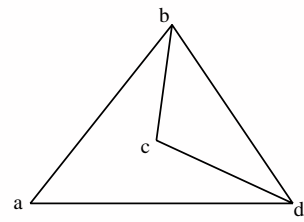


Figure 2

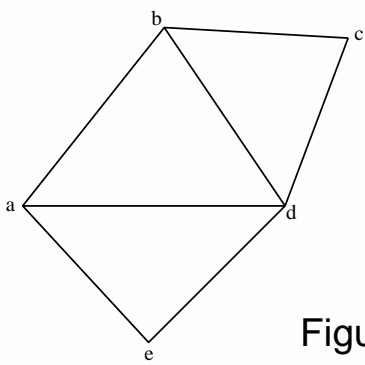


Figure 3

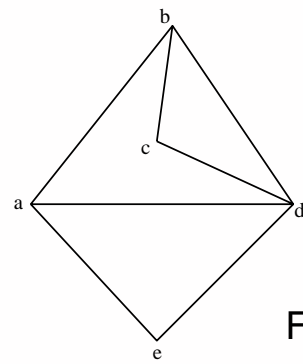


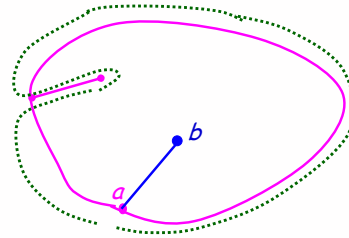
Figure 4

## Adding an edge to an embedding

- Two constructor cases:
- 1) Attach edge from vertex on a face to a new vertex.
  - 2) Attach edge between vertices on a face.

### Face Creation Rules

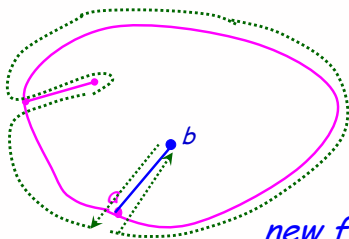
1) choose **face**: path  $\vec{p}$  from  $a$  to  $a$



add **edge** to **new vertex**  $b$

### Face Creation Rules

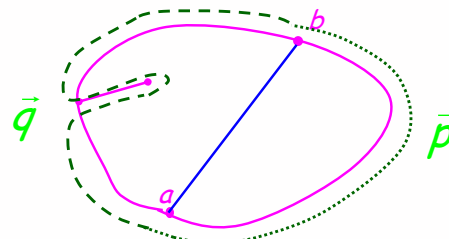
1) choose **face** = path  $\vec{p}$  from  $a$  to  $a$



add **edge** to **new vertex**  $b$   
**new face**:  $b\vec{p}b$

### Face Creation Rules

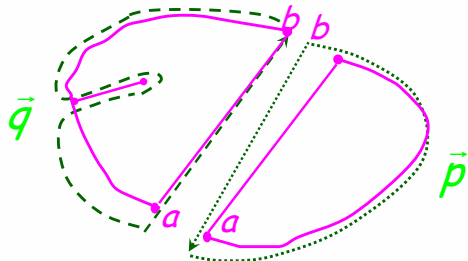
2) choose **face** = path  $a\vec{p}b\vec{q}a$



add **edge** across it

### Face Creation Rules

2) choose **face** = path  $a\vec{p}b\vec{q}a$



splits into 2 faces:  $a\vec{p}b\vec{q}a, a\vec{q}b\vec{p}a$