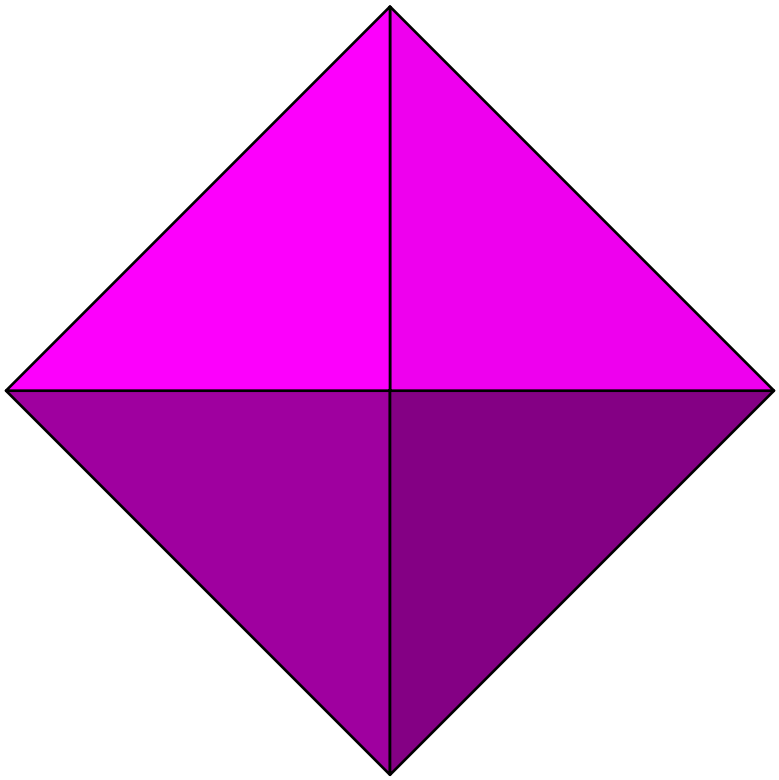
Let’s begin with a regular octagon:



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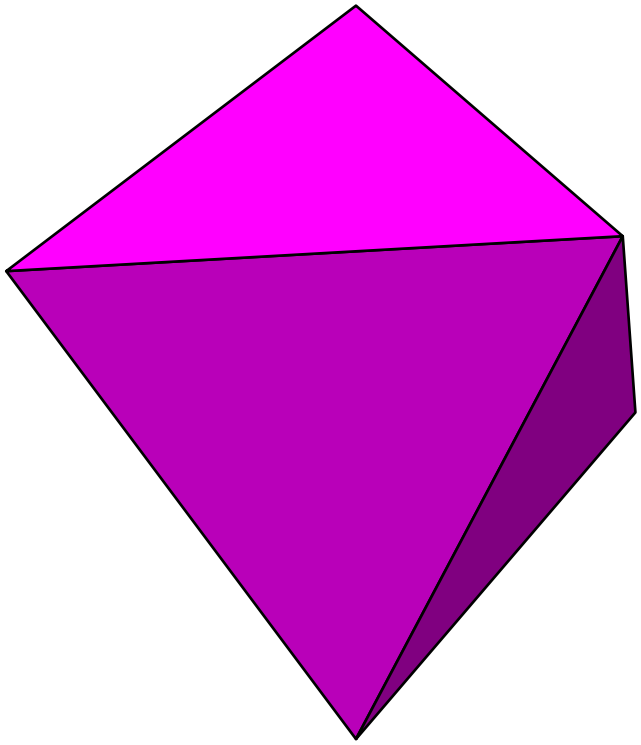
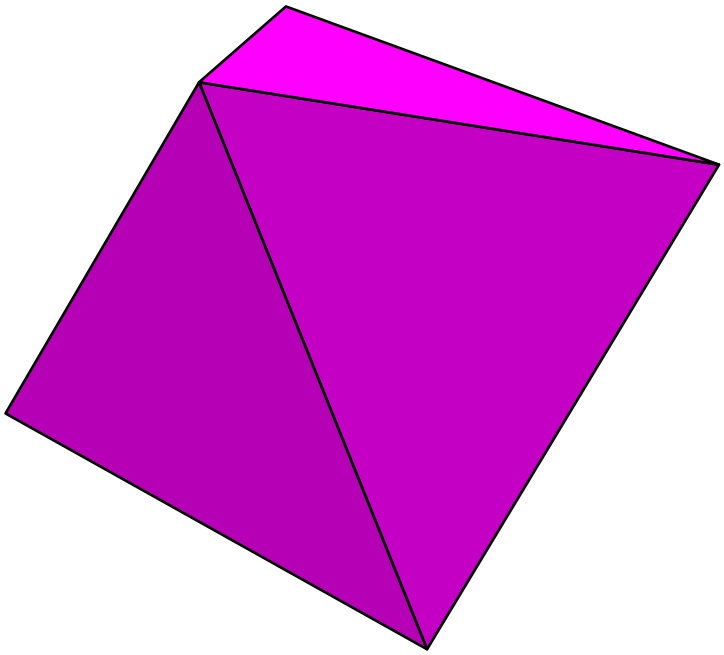


V + F - E = 2
6 + 8 - 12 = 2

Let’s begin with a regular octagon:



$$V + F - E = 2$$
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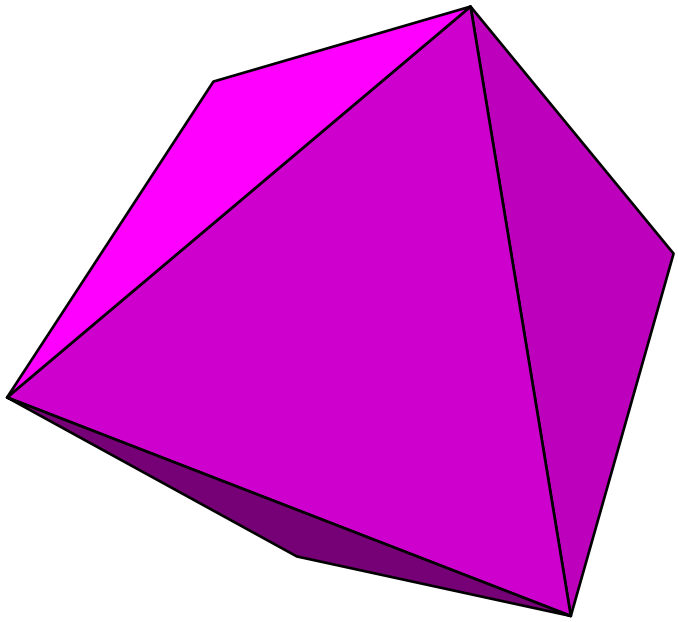

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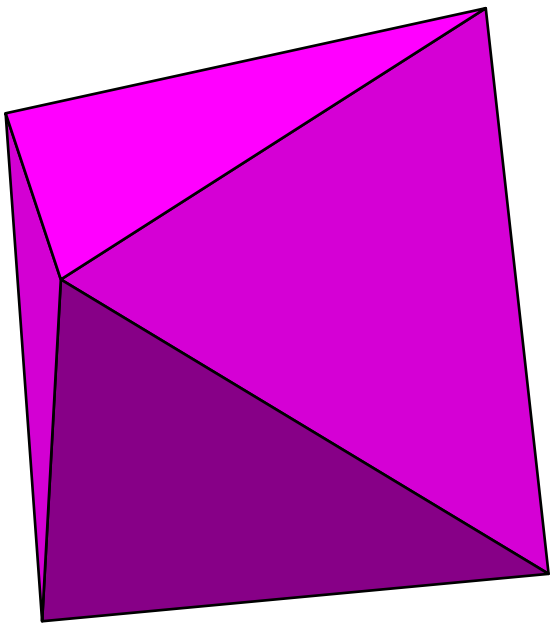

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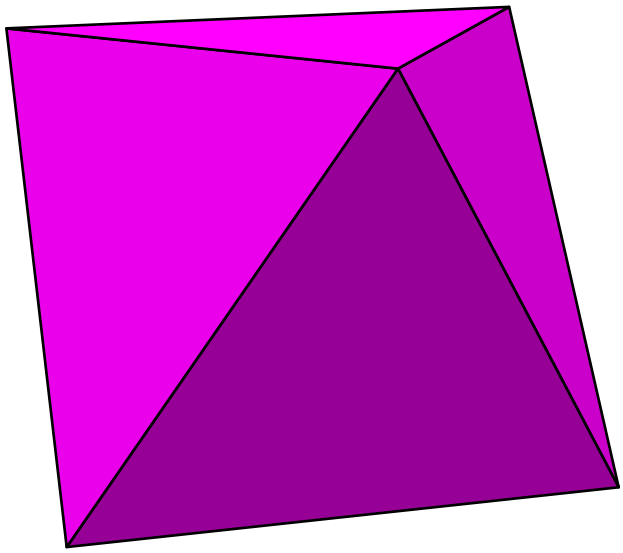

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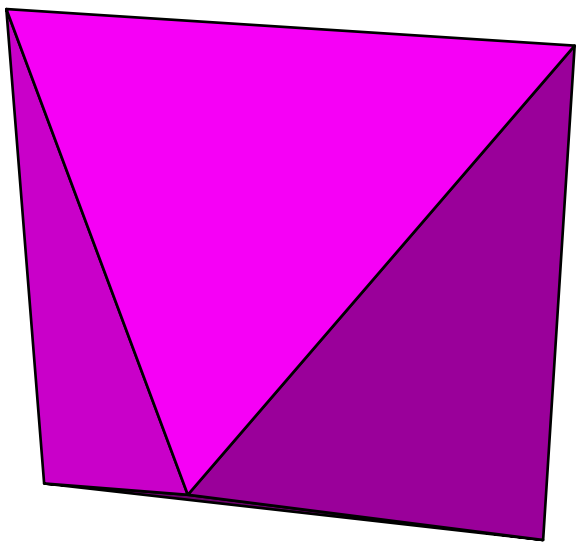

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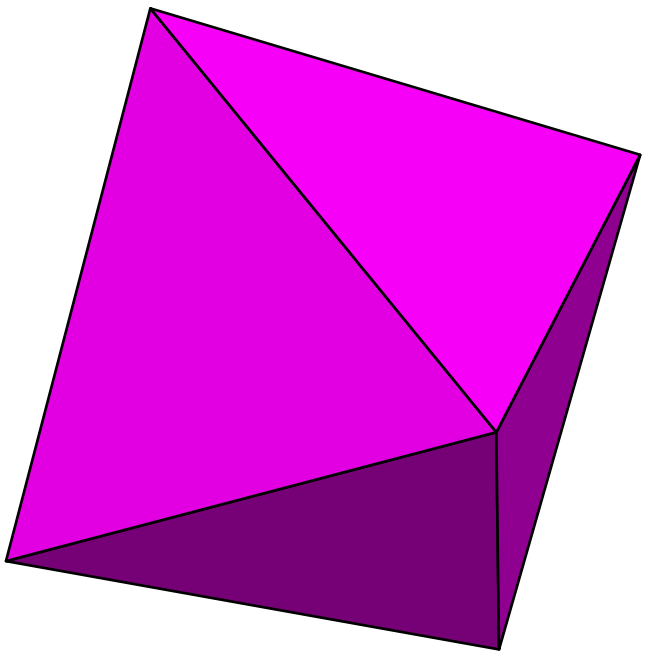

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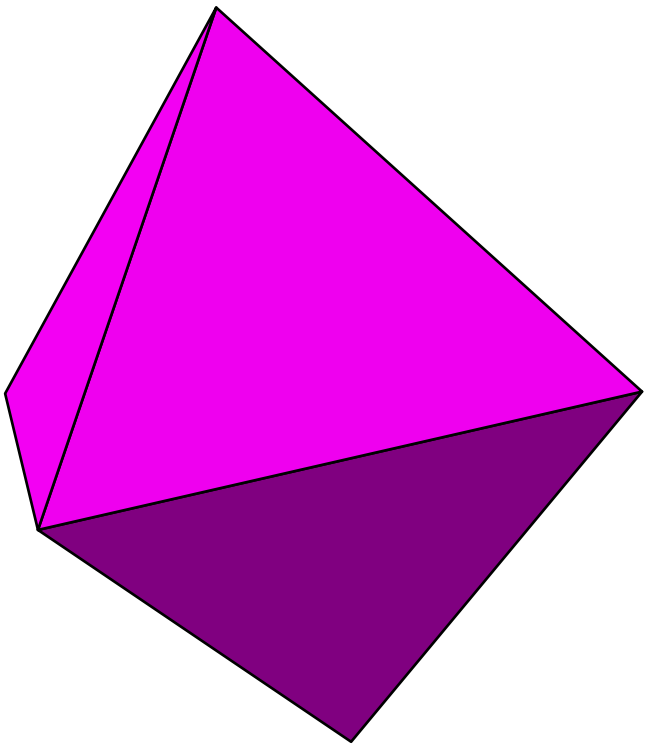

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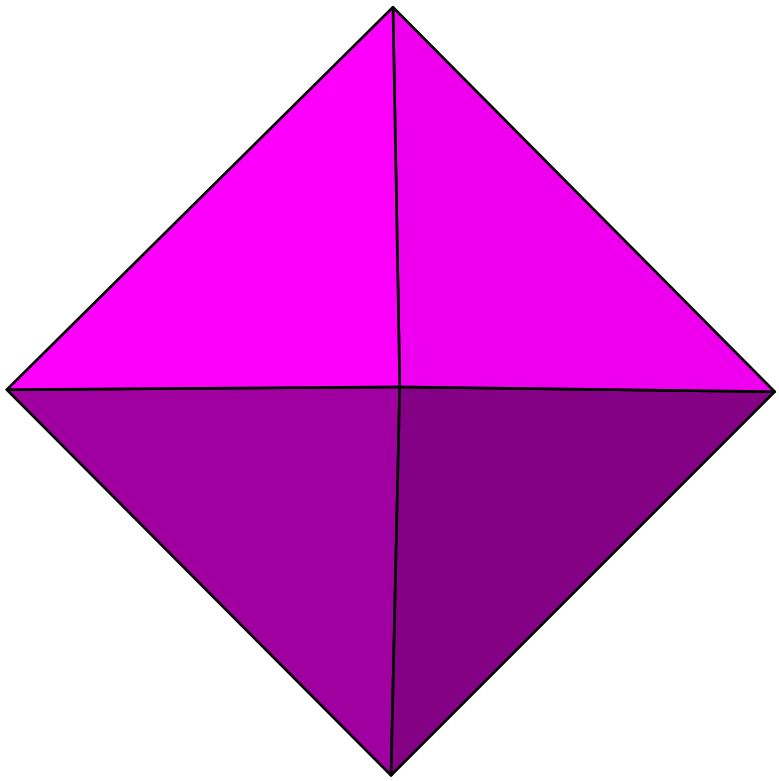
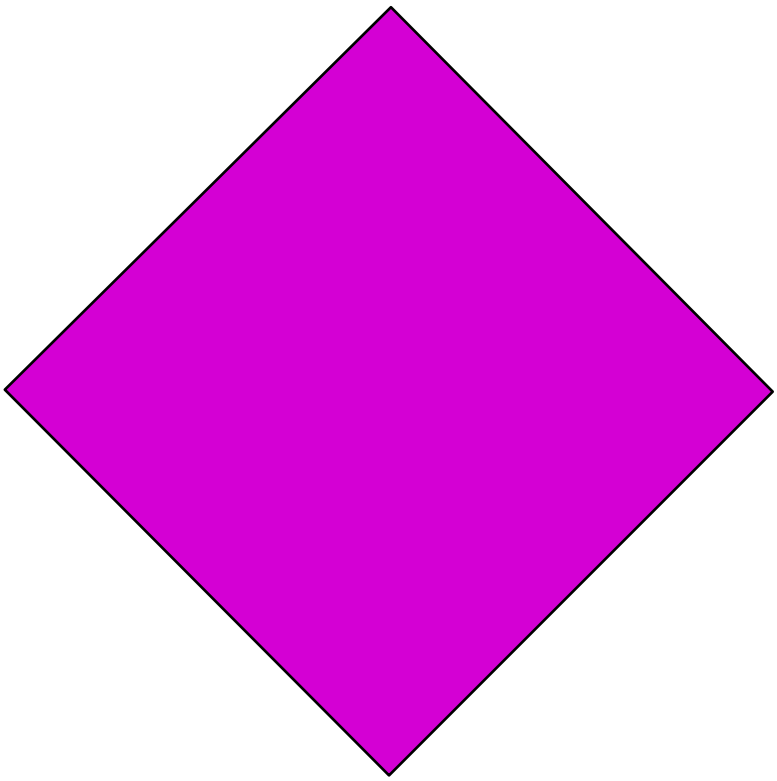


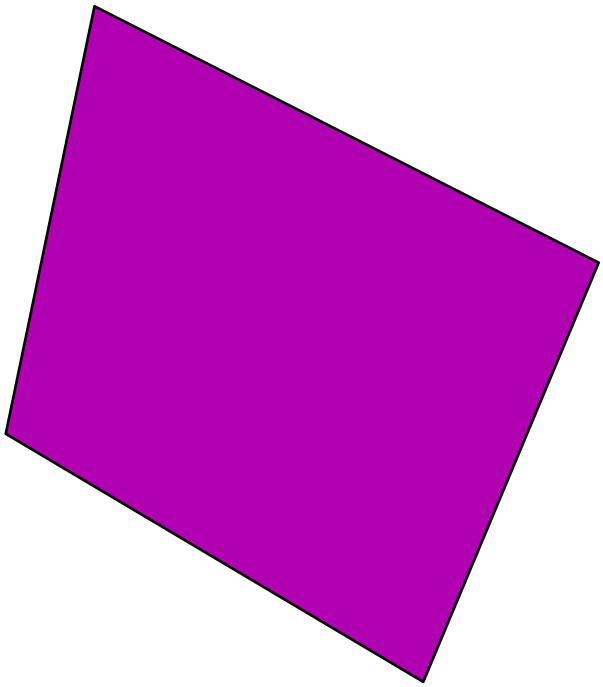
V + F - E = 2
6 + 8 - 12 = 2

We will now proceed to remove one vertex, which will decrease the number of vertices by 1, edges by 4, and faces by 3.
The formula holds.



V + F - E = 2
5 + 5 - 8 = 2

The result of this truncation belongs to the family of pyramidal polyhedra.



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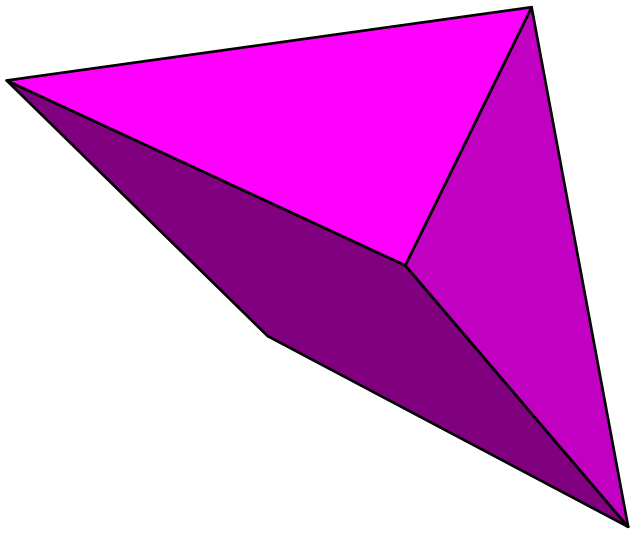

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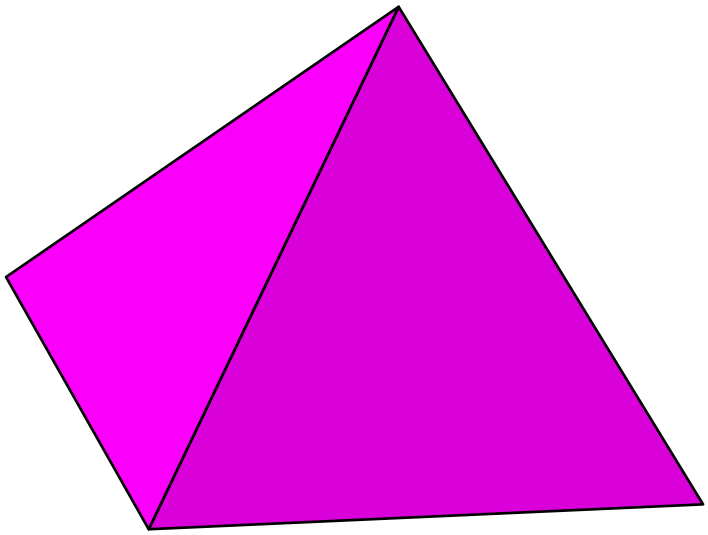

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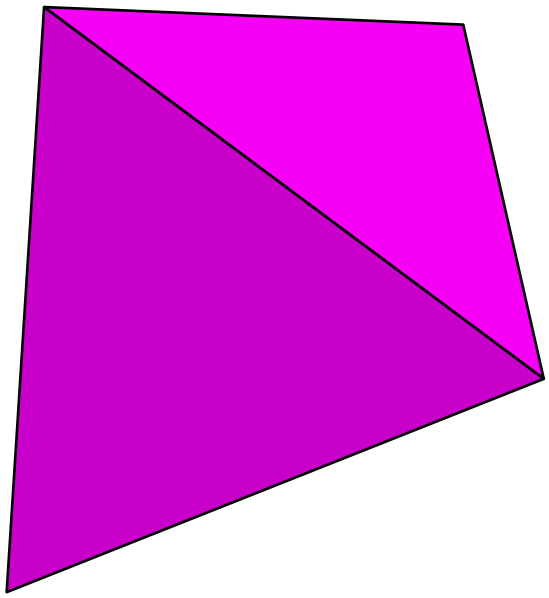

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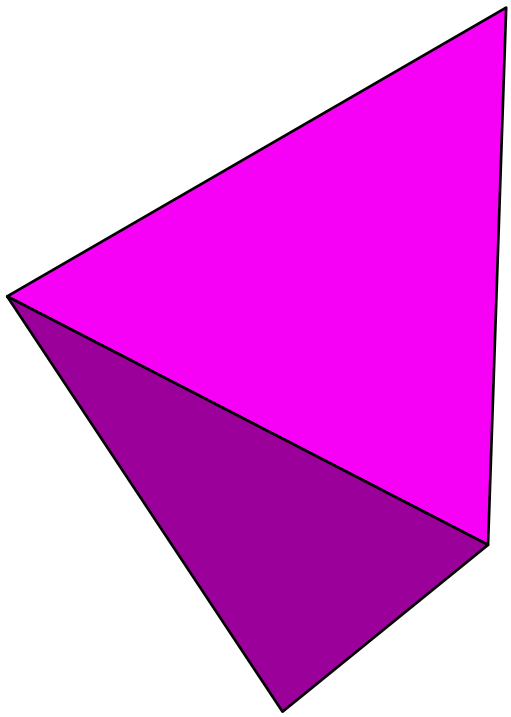

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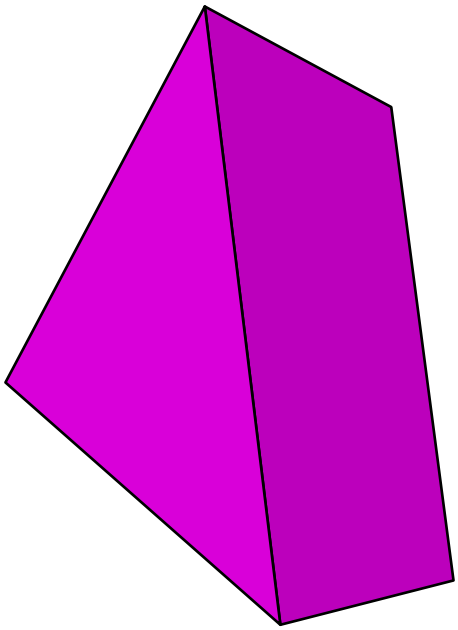

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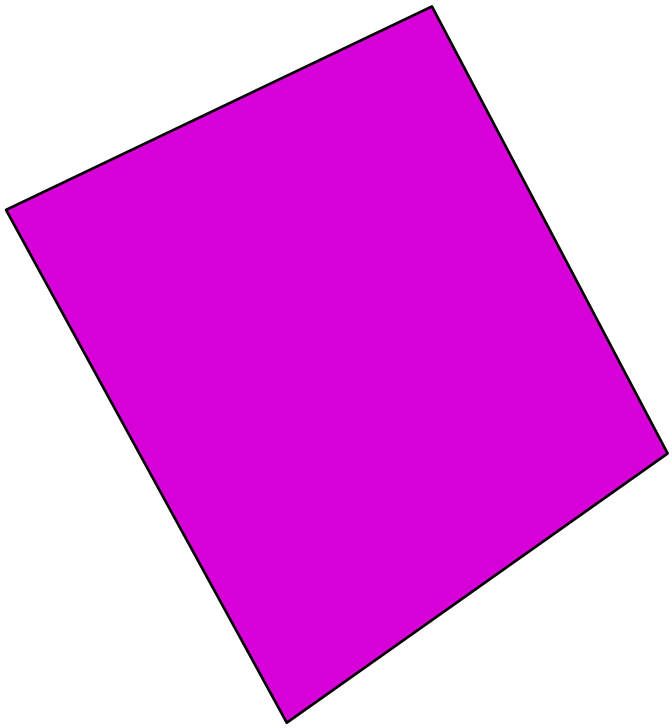

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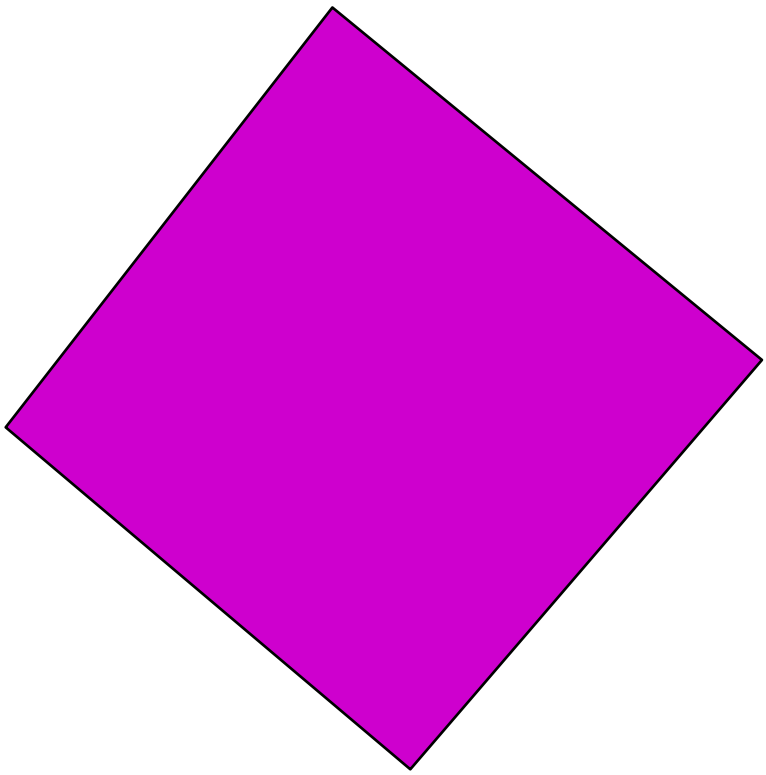

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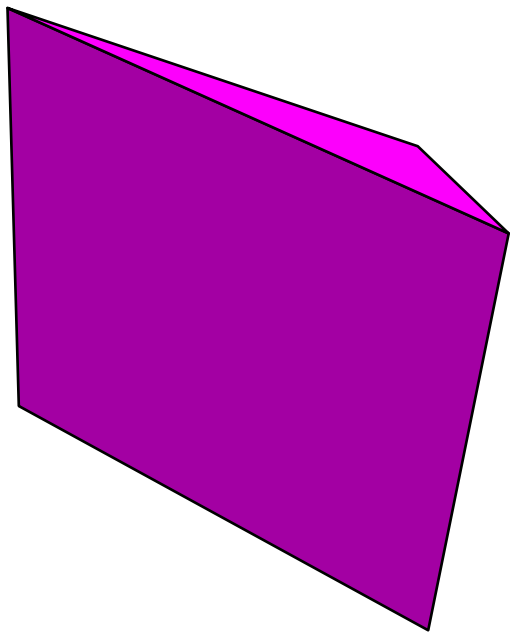

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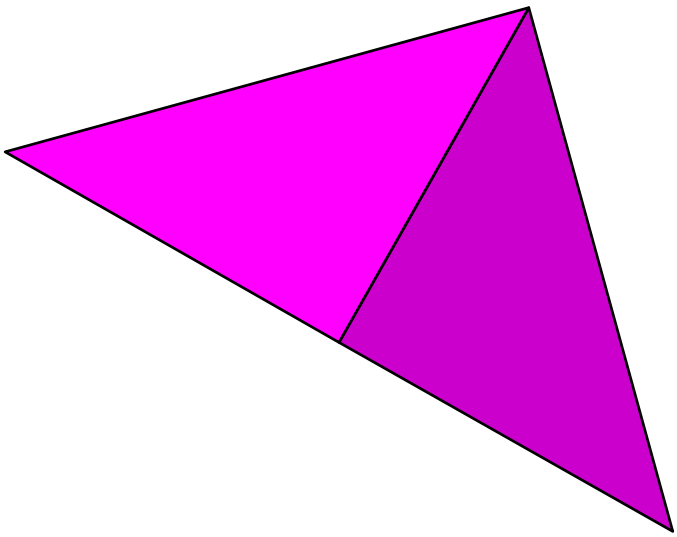

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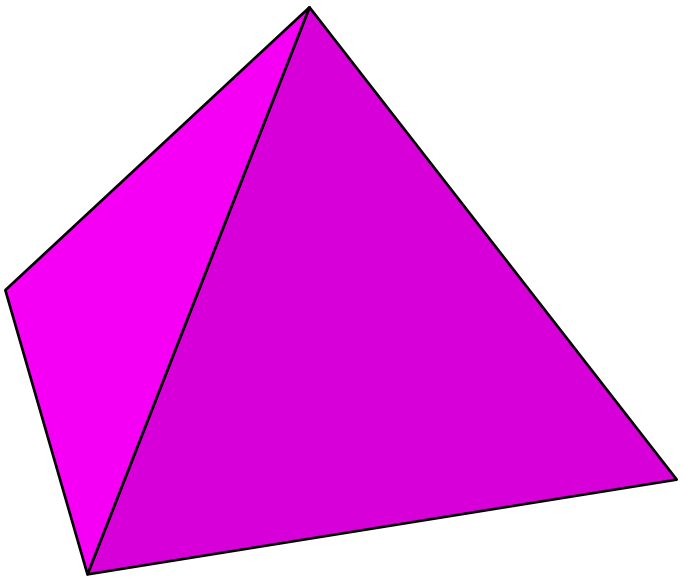

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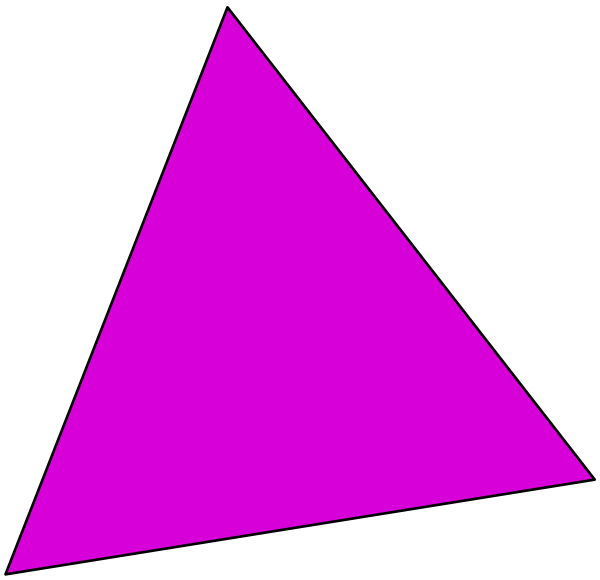
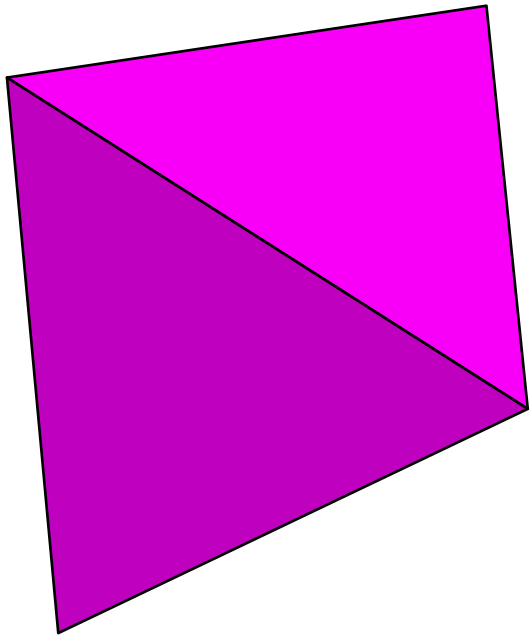


V + F - E = 2
4 + 3 - 5 = 2

If we were to remove another vertex, the result would be a degenerate image. As by removing 1 vertex we would remove 3 edges, and have only 2 faces, which doesn't satisfy the definition of a polyhedron.



$$V + F - E = 2$$
$$4 + 4 - 6 = 2$$

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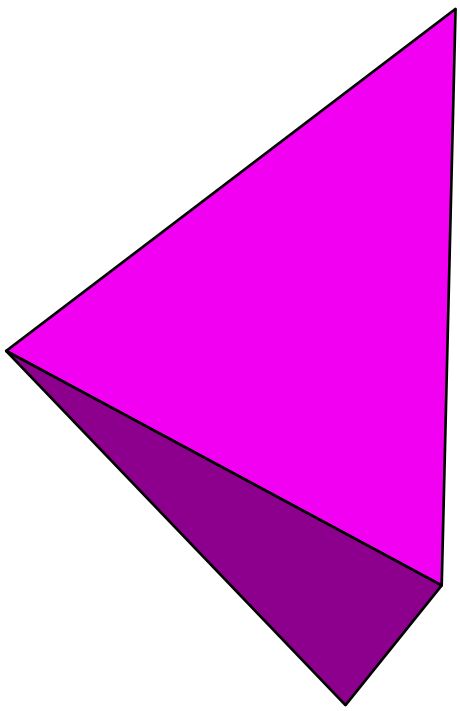

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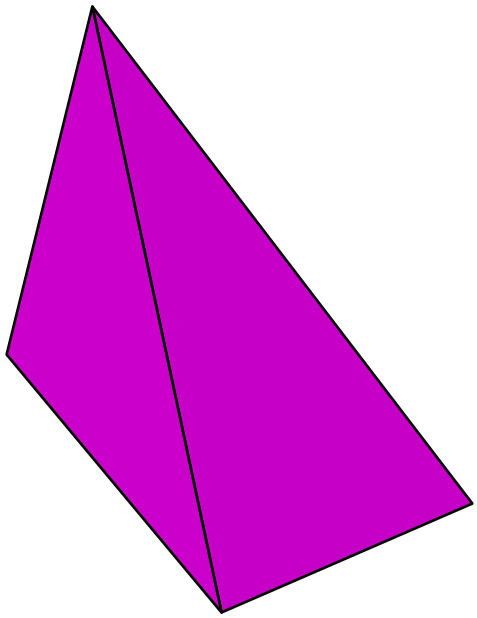

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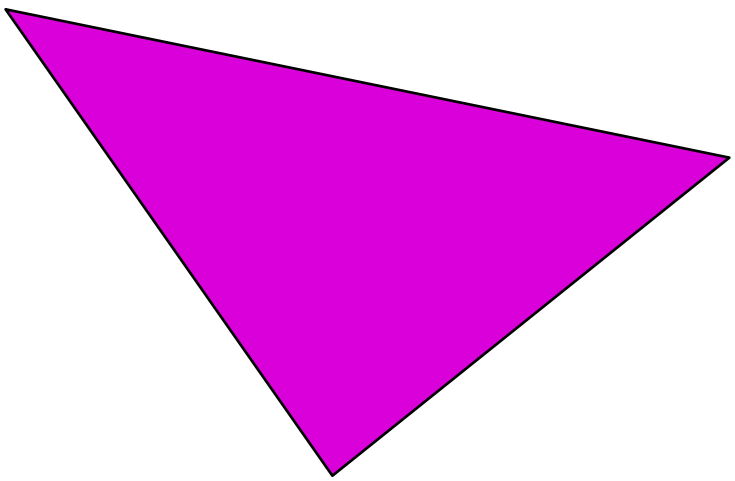

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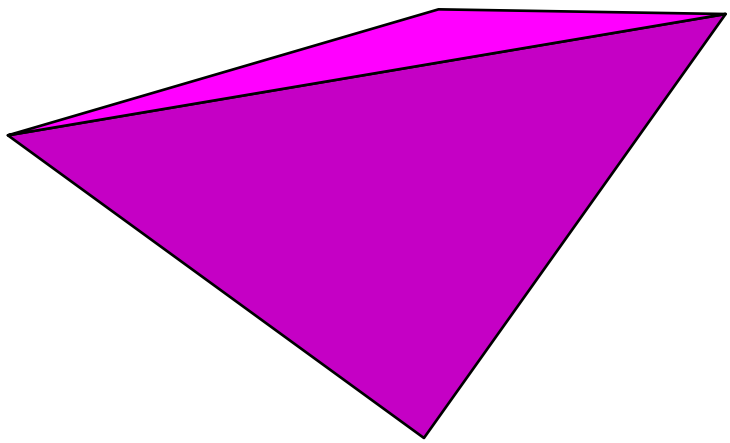

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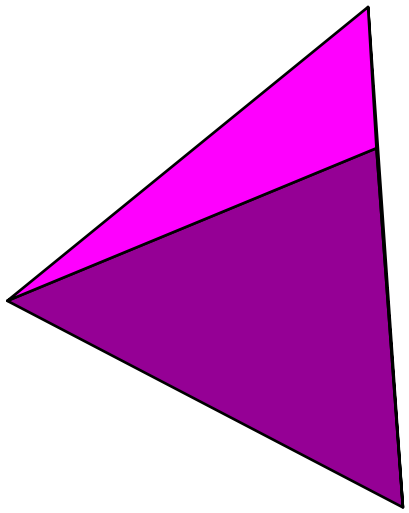

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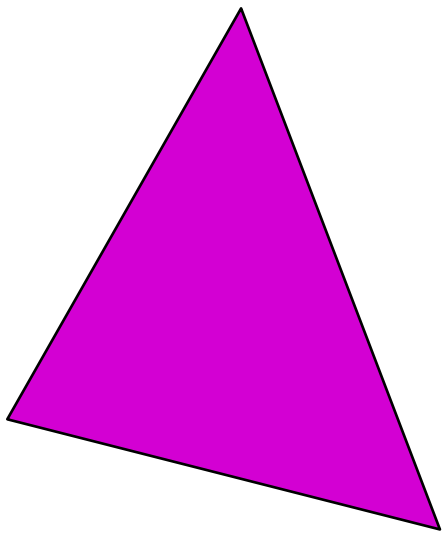

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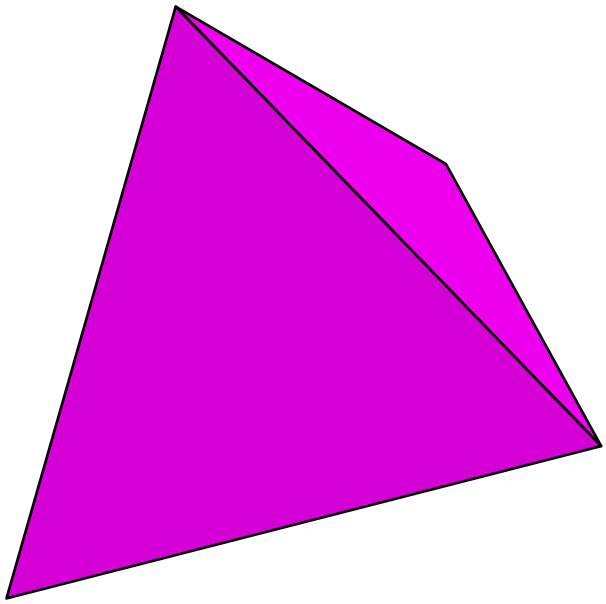

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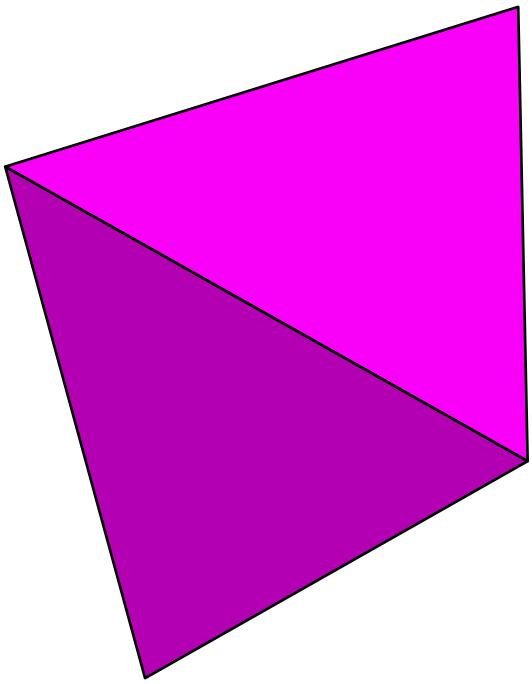

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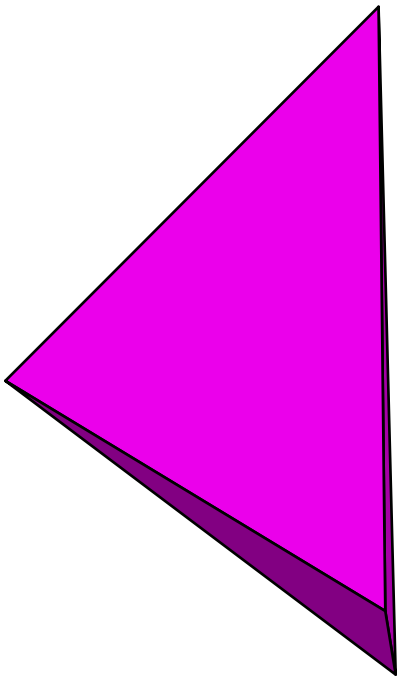

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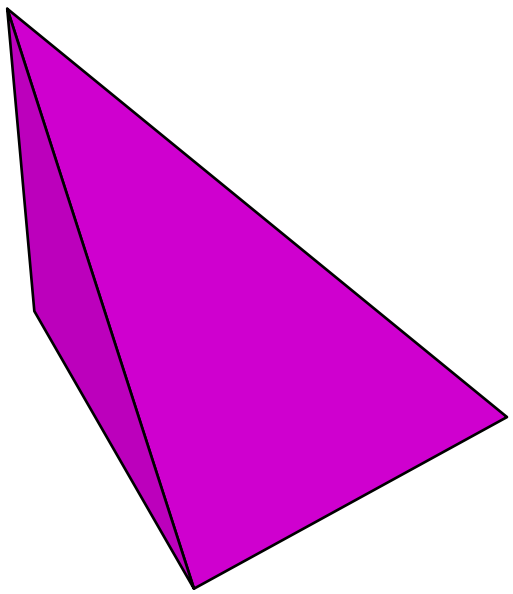

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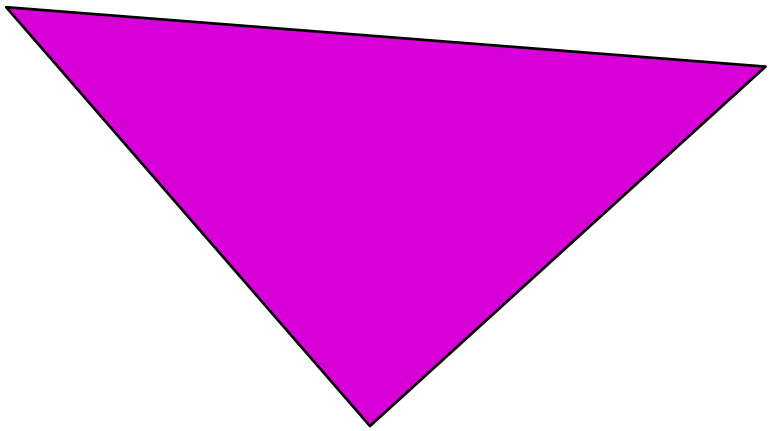

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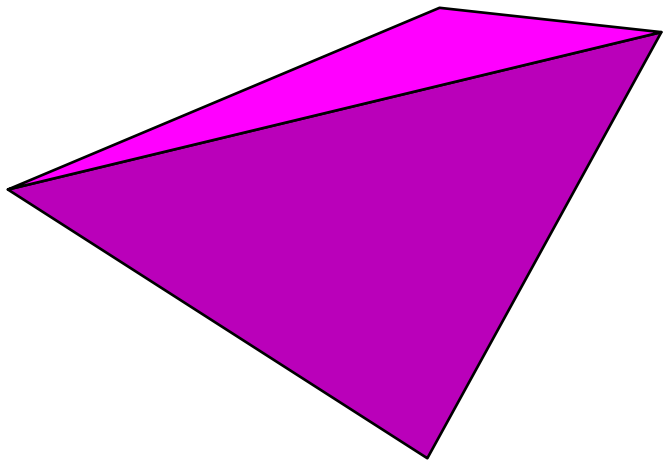

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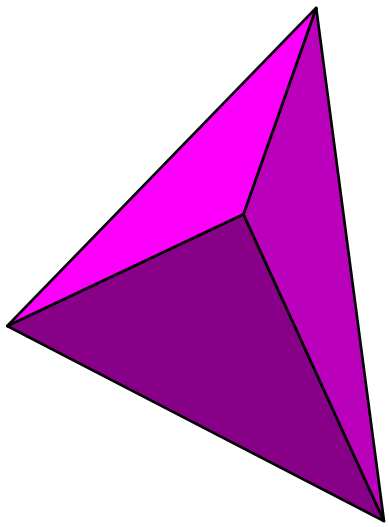

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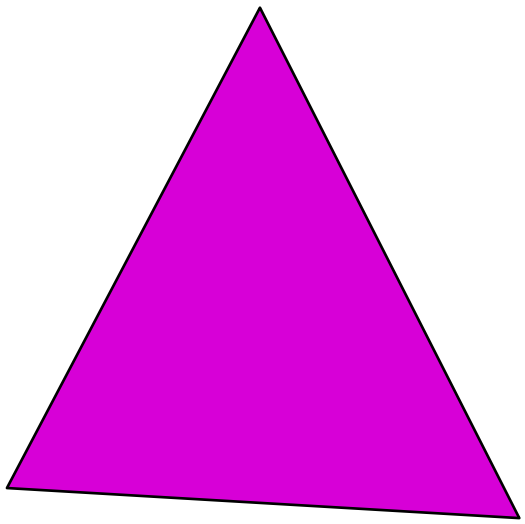
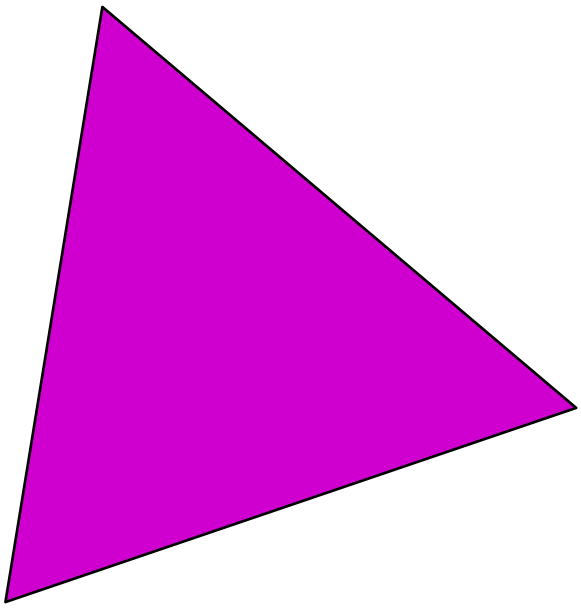


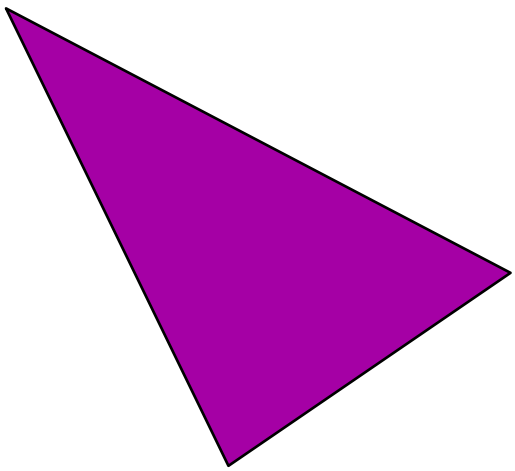
V + F - E = 2
4 + 4 - 6 = 2

Degenerate result:



V + F - E = 2
Doesn’t Hold.

Degenerate result:



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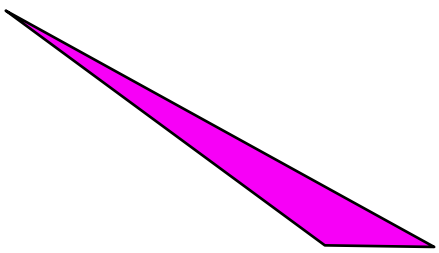

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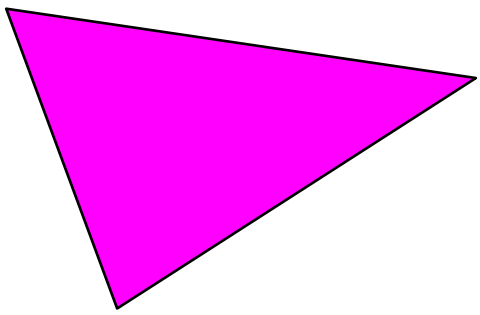

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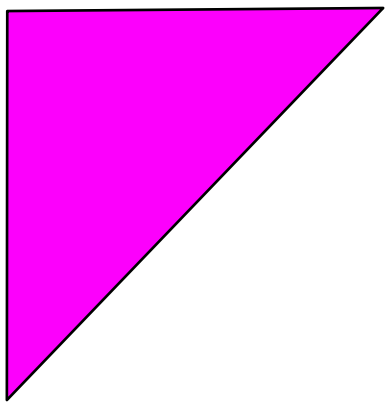

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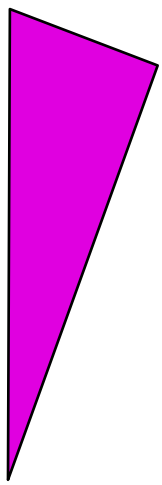

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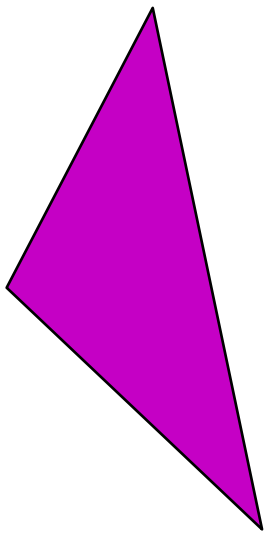
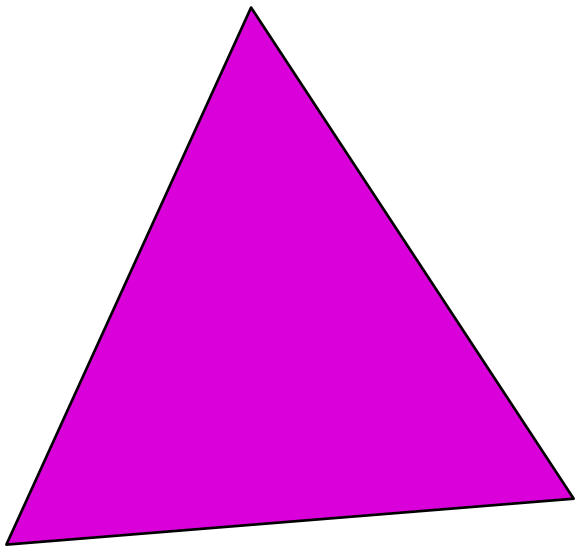
Doesn’t Hold.

Degenerate result:



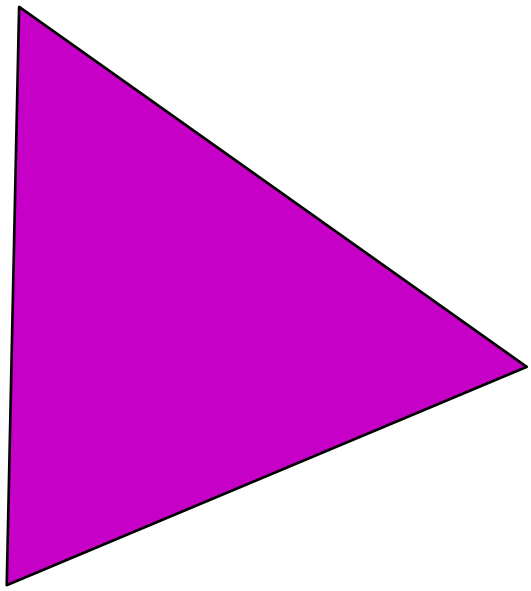
V + F - E = 2
Doesn’t Hold.

Degenerate result:



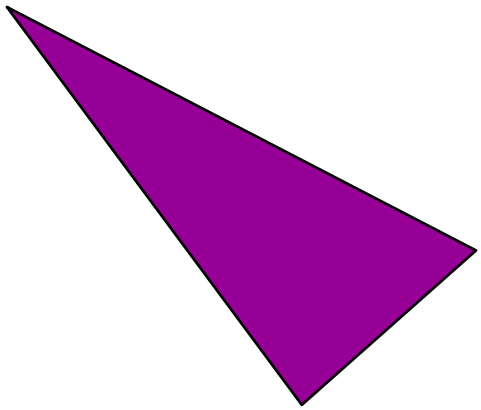
V + F - E = 2
Doesn’t Hold.

Degenerate result:



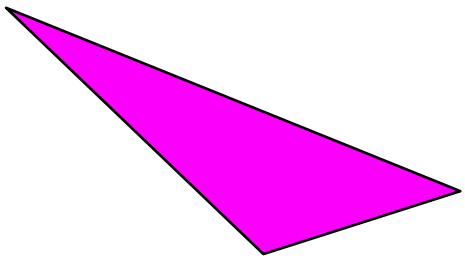
V + F - E = 2
Doesn’t Hold.

Degenerate result:



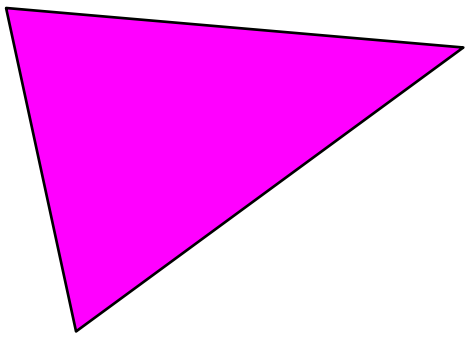
V + F - E = 2
Doesn’t Hold.

Degenerate result:



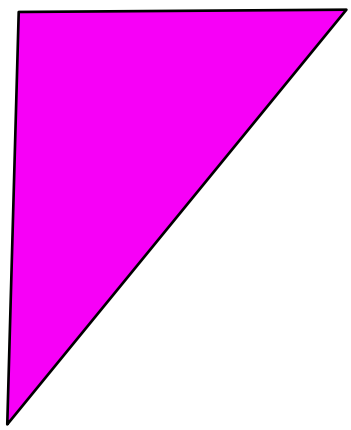
V + F - E = 2
Doesn’t Hold.

Degenerate result:



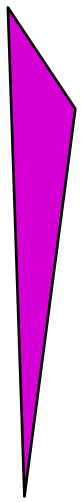
V + F - E = 2
Doesn’t Hold.

Degenerate result:



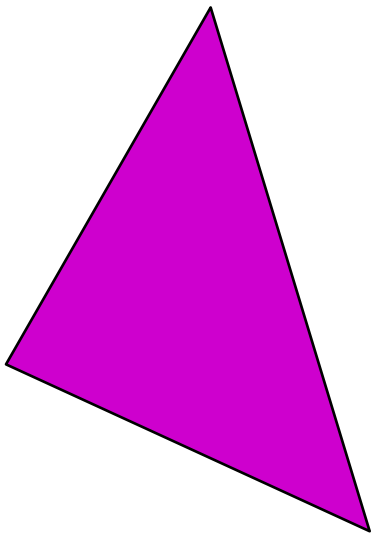
V + F - E = 2
Doesn’t Hold.

Degenerate result:



V + F - E = 2
Doesn’t Hold.

Degenerate result:



V + F - E = 2
Doesn’t Hold.