How to begin a TED talk

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- ✓ emphasise points with both hands near my head
- ✓ use an engaging story to draw you in

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- ✗ don’t use mathematics
- ✗ proofs: see above

Theorem (Euclid, 280 BC)

There is no largest prime number.

Prime numbers can only be divided by 1 and themselves

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3. $q + 1$ can't be divided by any of $2, 3, \ldots, p$

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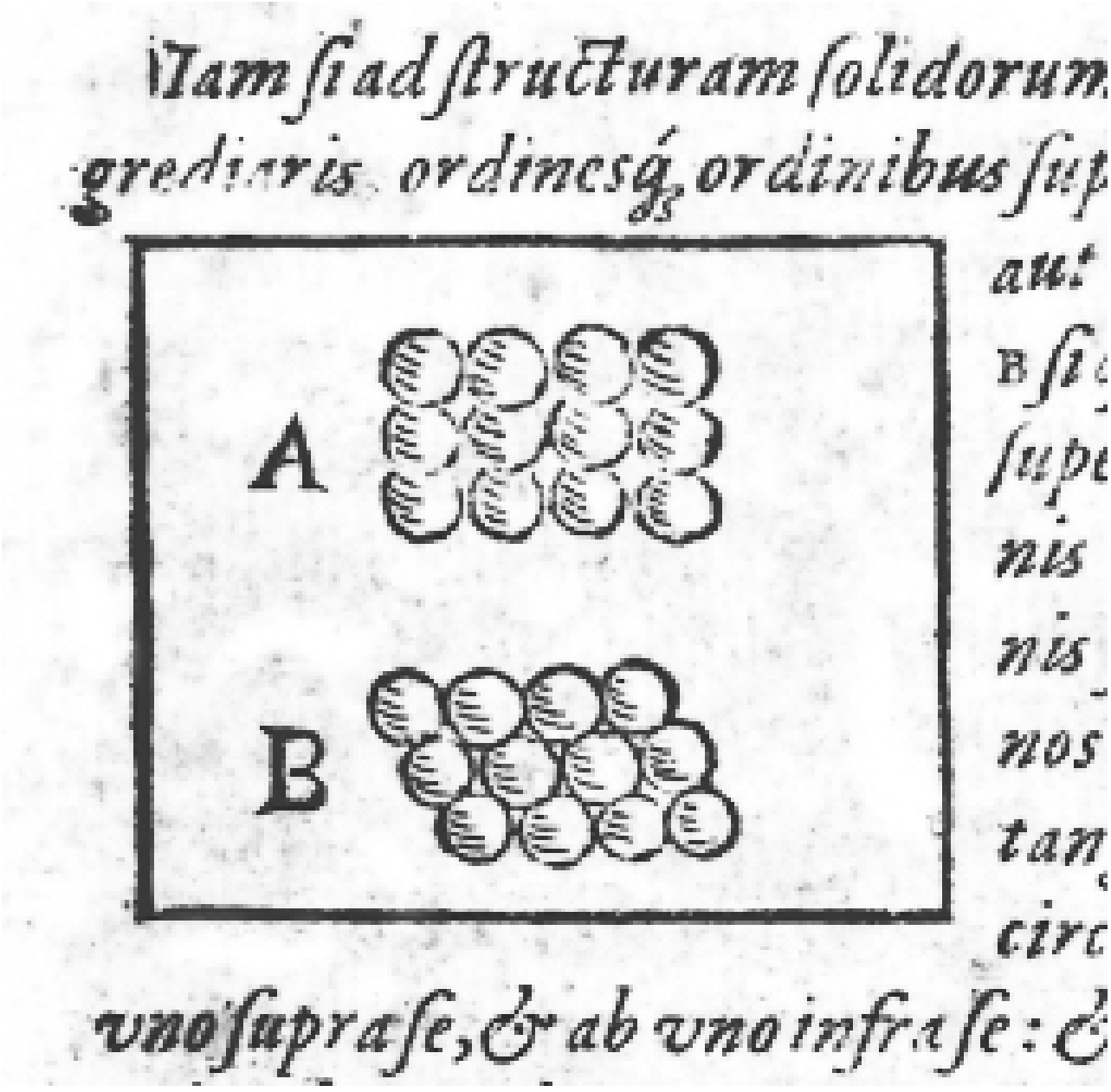
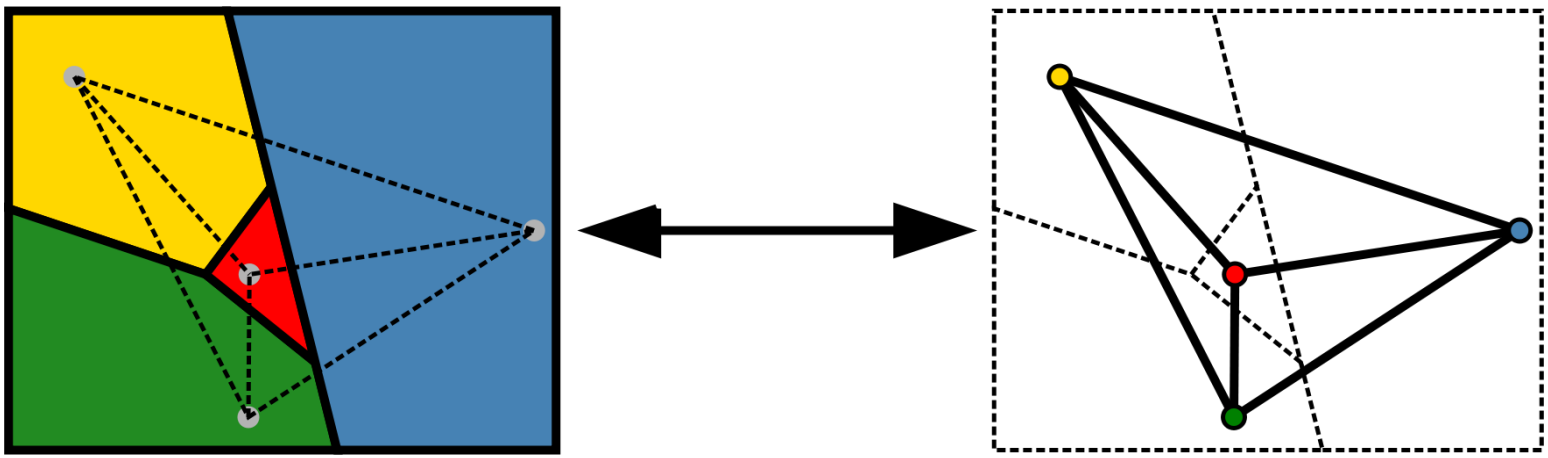
2. define $q = 1 \times 2 \times 3 \times \cdots \times p$
3. $q + 1$ can't be divided by any of $2, 3, \ldots, p$
4. $q + 1$, is either
   - a prime number itself; or
   - can be divided by a prime number bigger than p

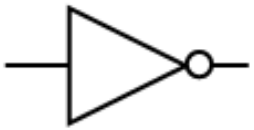
Kepler's cannonballs



Four colours suffice



$\frac{4,195,835}{3,145,727} \approx 1.3337$ or 1.3338?



NOT

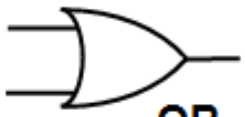
Input	Output
I	F
0	1
1	0

AND

Inputs		Output
A	B	F
0	0	0
1	0	0
0	1	0
1	1	1

NAND

Inputs		Output
A	B	F
0	0	1
1	0	1
0	1	1
1	1	0



OR

Inputs		Output
A	B	F
0	0	0
1	0	1
0	1	1
1	1	1

NOR

Inputs		Output
A	B	F
0	0	1
1	0	0
0	1	0
1	1	0

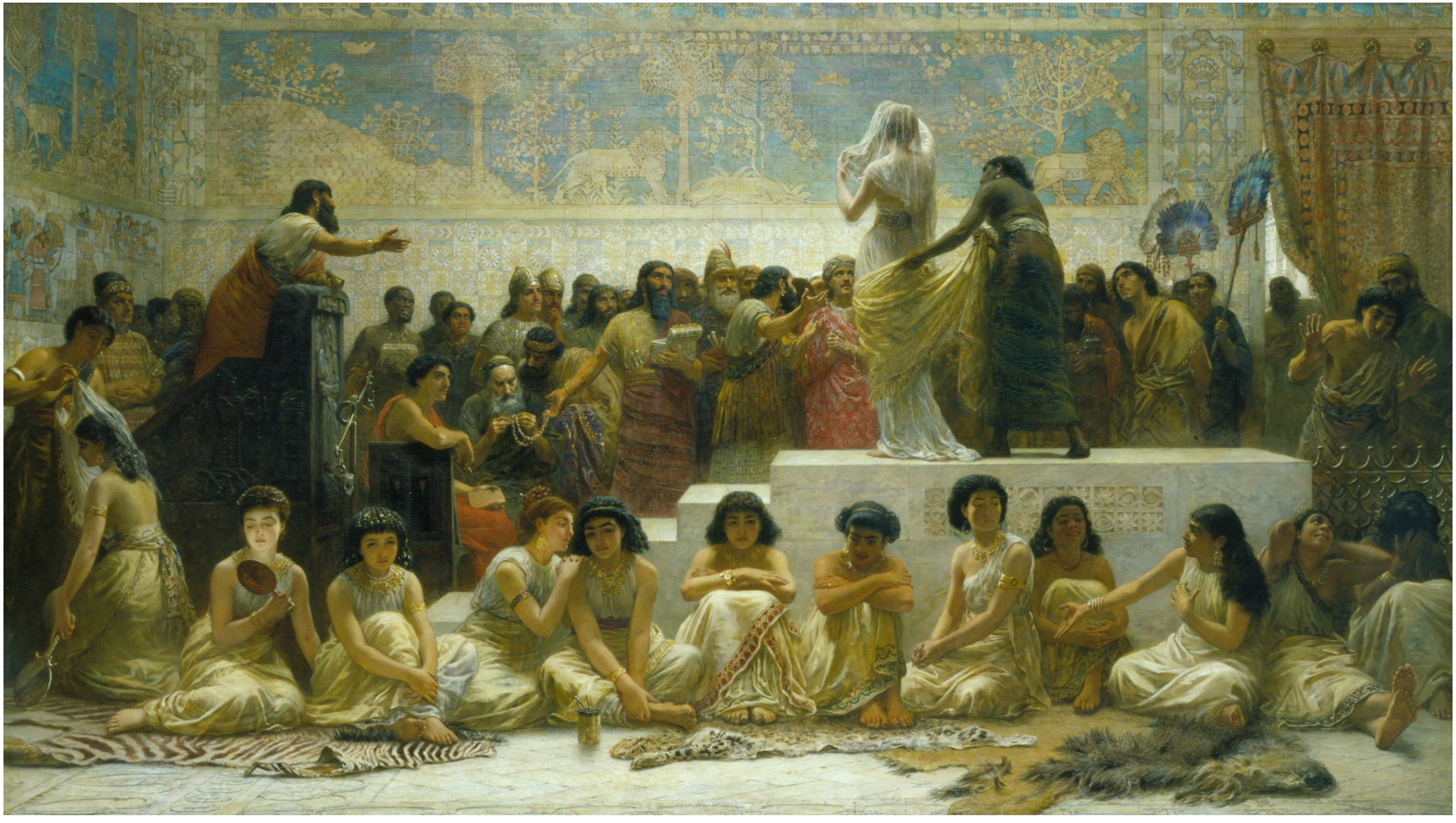
EXCLUSIVE OR

Inputs		Output
A	B	F
0	0	0
0	1	1
1	0	1
1	1	0

EXCLUSIVE NOR

Inputs		Output
A	B	F
0	0	1
0	1	0
1	0	0
1	1	1

Long's Babylonian marriage auction



Theorem (Vickrey, 1961 AD)

In a second-price auction, it is weakly dominant for each buyer to bid its valuation. Furthermore, the auction is efficient.