

Lazy caterer — Up to 10 cuts

Name: _____

Date: _____



A pancake is cut by straight lines. Find the most pieces, and show why it stops doubling.

- 1 A pizza is cut with 7 straight cuts, each going all the way across, and nothing is rearranged between cuts.

What is the greatest number of pieces?

Why

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- 2 A round pancake is cut by 4 straight cuts, each cut a full line right across it, and no piece is moved between cuts.

What is the greatest number of pieces?

Why

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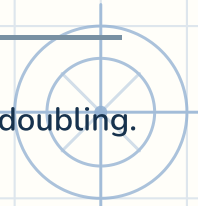
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A pancake is cut by straight lines. Find the most pieces, and show why it stops doubling.

- 3 A pizza is cut with 3 straight cuts, each going all the way across, and nothing is rearranged between cuts.

What is the greatest number of pieces?

Why

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- 4 A pizza is cut with 2 straight cuts, each going all the way across, and nothing is rearranged between cuts.

What is the greatest number of pieces?

Why

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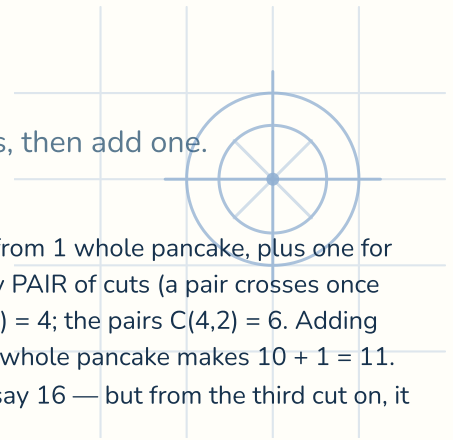
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Lazy caterer · Up to 10 cuts — Answer key

If they are stuck

- Doubling stops working. Count the cuts, then the pairs of cuts that cross, then add one.



1. The most pieces come from 1 whole pizza, plus one for each cut and one for every PAIR of cuts (a pair crosses once inside). The cuts are $C(7,1) = 7$; the pairs $C(7,2) = 21$. Adding them, $7 + 21 = 28$, and the whole pizza makes $28 + 1 = 29$. The doubling 2, 4 would say 128 — but from the third cut on, it is wrong.

3. The most pieces come from 1 whole pizza, plus one for each cut and one for every PAIR of cuts (a pair crosses once inside). The cuts are $C(3,1) = 3$; the pairs $C(3,2) = 3$. Adding them, $3 + 3 = 6$, and the whole pizza makes $6 + 1 = 7$. The doubling 2, 4 would say 8 — but from the third cut on, it is wrong.

2. The most pieces come from 1 whole pancake, plus one for each cut and one for every PAIR of cuts (a pair crosses once inside). The cuts are $C(4,1) = 4$; the pairs $C(4,2) = 6$. Adding them, $4 + 6 = 10$, and the whole pancake makes $10 + 1 = 11$. The doubling 2, 4 would say 16 — but from the third cut on, it is wrong.

4. The most pieces come from 1 whole pizza, plus one for each cut and one for every PAIR of cuts (a pair crosses once inside). The cuts are $C(2,1) = 2$; the pairs $C(2,2) = 1$. Adding them, $2 + 1 = 3$, and the whole pizza makes $3 + 1 = 4$. The doubling 2, 4 would say 4 — but from the third cut on, it is wrong.