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 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.

29

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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Name: _____ Date: _____

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

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

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.

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.

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.

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.