Puzzle 1

Look at the pyramid below (Figure 1). The first row sums to 1, the second row sums to 11, the third to 39, etc. What is the sum of the 99th row?
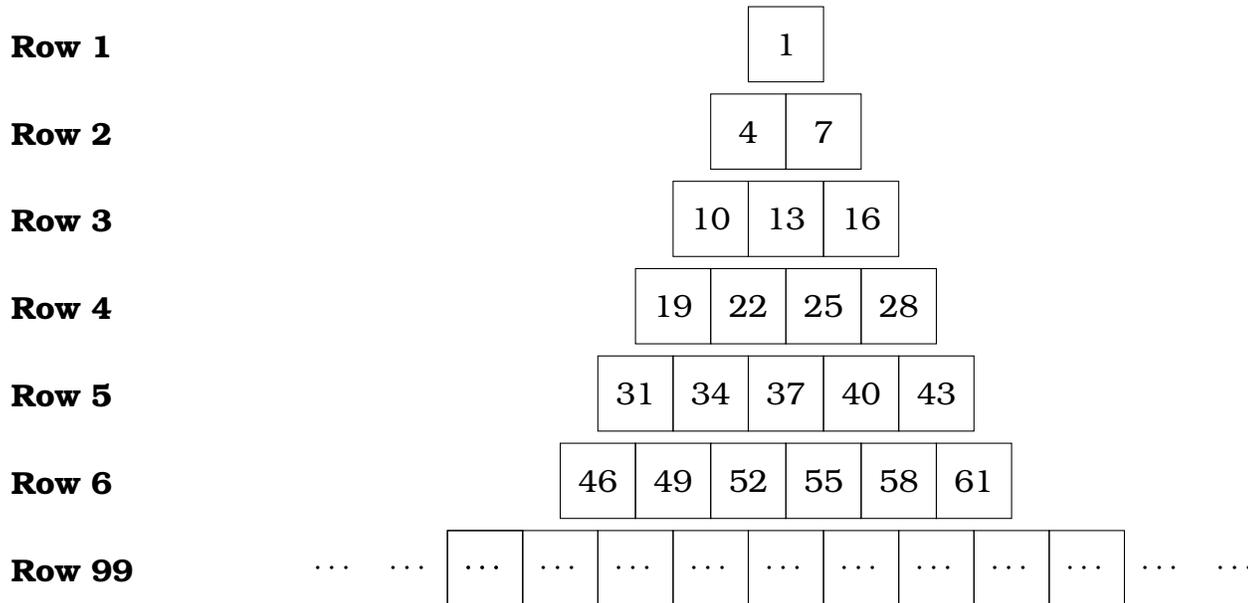
Row 1 — 1

Row 2 — 4 7

Row 3 — 10 13 16

Row 4 — 19 22 25 28

Row 5 — 31 34 37 40 43

Row 6 — 46 49 52 55 58 61

Row 99 — ... ...

Figure 1: Puzzle 1

This puzzle was adapted from the *Scientific American.*

Puzzle 2

Among the natural numbers below 100, there are these thirty with a special property. I have listed them in the table here (Figure 2). But then I discovered that I made a mistake, and one of these numbers must be replaced. Which number must be inserted in place of the incorrect number?

This puzzle was adapted from the *Scientific American.*

6	10	14	15	21	22
26	33	34	35	38	39
46	52	55	57	58	62
65	69	74	77	82	85
86	87	91	93	94	95

Figure 2: Puzzle 2

Puzzle 3

ABCD is a square (Figure 3). Each side is 5 (arbitrary units). Find the area of the brown shaded region.
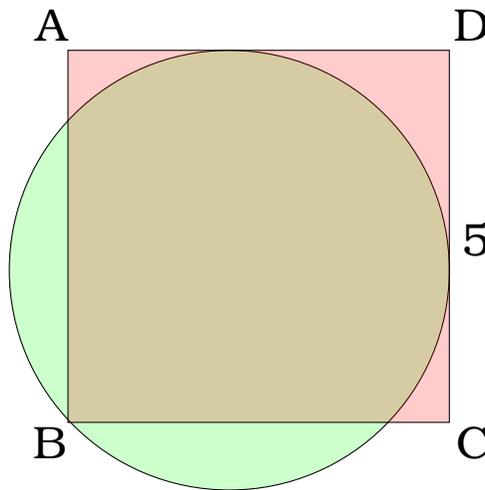
Figure 3: Puzzle 3