

☐ A ☐ B ☐ C ☒ D ☐ E ☐ F ☐ G ☐ H

Section
1

1	A B C D	9	A B C D	17	A B C D	25	A B C D	33	A B C D	41	A B C D
2	A B C D	10	A B C D	18	A B C D	26	A B C D	34	A B C D	42	A B C D
3	A B C D	11	A B C D	19	A B C D	27	A B C D	35	A B C D	43	A B C D
4	A B C D	12	A B C D	20	A B C D	28	A B C D	36	A B C D	44	A B C D
5	A B C D	13	A B C D	21	A B C D	29	A B C D	37	A B C D	45	A B C D
6	A B C D	14	A B C D	22	A B C D	30	A B C D	38	A B C D	46	A B C D
7	A B C D	15	A B C D	23	A B C D	31	A B C D	39	A B C D	47	A B C D
8	A B C D	16	A B C D	24	A B C D	32	A B C D	40	A B C D		

Section
2

1	A B C D	9	A B C D	17	A B C D	25	A B C D	33	A B C D	41	A B C D
2	A B C D	10	A B C D	18	A B C D	26	A B C D	34	A B C D	42	A B C D
3	A B C D	11	A B C D	19	A B C D	27	A B C D	35	A B C D	43	A B C D
4	A B C D	12	A B C D	20	A B C D	28	A B C D	36	A B C D	44	A B C D
5	A B C D	13	A B C D	21	A B C D	29	A B C D	37	A B C D		
6	A B C D	14	A B C D	22	A B C D	30	A B C D	38	A B C D		
7	A B C D	15	A B C D	23	A B C D	31	A B C D	39	A B C D		
8	A B C D	16	A B C D	24	A B C D	32	A B C D	40	A B C D		

Section
3
$$\frac{4}{17}$$

Student-Produced Responses Enter answers as directed in your test book. Answers must be bubbled to be scored. You will not receive credit for anything written in the boxes

Figure 1 displays four 10x10 grids (labeled 14, 15, 16, and 17) representing the evolution of a 1D cellular automaton. Each grid shows the state of 10 cells (rows) at a specific time step (columns). The cells are either 0 (white) or 1 (black). The evolution starts from a single '1' at position 5 in grid 14 and spreads outwards, forming a triangular pattern of '1's in the subsequent grids.

Section
4

1	A	B	C	D	15	A	B	C	D
2	A	B	C	D	16	A	B	C	D
3	A	B	C	D	17	A	B	C	D
4	A	B	C	D	18	A	B	C	D
5	A	B	C	D	19	A	B	C	D
6	A	B	C	D	20	A	B	C	D
7	A	B	C	D	21	A	B	C	D
8	A	B	C	D	22	A	B	C	D
9	A	B	C	D	23	A	B	C	D
10	A	B	C	D	24	A	B	C	D
11	A	B	C	D	25	A	B	C	D
12	A	B	C	D	26	A	B	C	D
13	A	B	C	D	27	A	B	C	D
14	A	B	C	D					

Student-Produced Responses Enter answers as directed in your test book. Answers must be initialed to be scored. You will not receive credit for anything written in the boxes.

Figure 1 displays four 10x10 grids representing the evolution of a cellular automaton over iterations 28, 29, 30, and 31. Each grid has a top row of four empty cells. The cells contain numbers 0-9 or are empty. Iteration 28 shows a pattern of 1s and 0s. Iteration 29 shows a more complex pattern with 1s, 0s, and 8s. Iteration 30 shows a pattern with 1s, 0s, 2s, 3s, 4s, 5s, 6s, 7s, 8s, and 9s. Iteration 31 shows a pattern with 1s, 0s, 2s, 3s, 4s, 5s, 6s, 7s, 8s, and 9s.