BR1100

Solar Powered Chemical Injection Pump

Setting Controller Stroke and Frequency

Step 1: Determine the pressure that the pump will be injecting into in psi.
Injection Pressure = _____ psi

Step 2: Determine the daily volume that is required to be injected in liters per day.
Daily Injection Volume = _____L/day

Step 3: Use TABLE 1 to approximate the DUTY CYCLE required from the pump. Locate the approximate injection pressure listed on the top of the table and then follow the column down to the approximate daily injection volume located on the left column of the table, the intersecting box is the approximate duty cycle required (ie. for an injection pressure of 250 psi and a daily injection volume of 20 L/day, the duty cycle would be 1.72).
Duty Cycle = _____

Step 4: Determine the frequency of pump cycles required. This is how often (per minute) that the pump will turn on. This can be calculated by dividing 60 by the length of time (in seconds) between pump start cycles (ie. if you wish to have the pump operate once every minute (every 60 seconds), the frequency would be 1, (60 divided by 60 = 1). If you wish to have the pump operate once every 2 minutes (every 120 seconds) the frequency would be 0.5, (60 divided by 120 = 0.5)).
Frequency = _____

Step 5: Use TABLE 2 to determine the stroke by locating the required duty cycle under the required frequency column. The frequency is located across the top of the table and the stroke is located on the left column of the table (ie. for a duty cycle of 1.72 based on a frequency = 1, the stroke would be either 1 or 1.1).
Stroke = _____

Step 6: Enter the Stroke and Frequency into the controller. The resulting Duty Cycle will be displayed.

NOTE: *Similar Duty Cycles can be achieved at various combinations of Stroke and Frequency. The volume output represented here is to be used as a guide only. To accurately set the daily injection rate, the use of a calibrated injection gage is required.*

Useful Formulas'
Duty Cycle = (Stroke * Frequency *100) / 60
Time between Start Cycles (in seconds) = 60 / frequency
Stroke = 0.6 * Duty Cycle / Frequency
Frequency = 0.6 * Duty Cycle / Stroke

9001-20 Street NW, Edmonton, Alberta, Canada T6P 1K8 **Phone: 780-430-1777** **Fax: 780-449-5233**
Email: info@bruinpumps.com **www.bruinpumps.com**

Table 1 - Determine Required Duty Cycle from Required Pressure and Volume

Volume L/day	Pressure PSI																	
	0		100		250		500		1000		1500		2000		2500		3000	
	On time (s/min)	Duty cycle	On time (s/min)	Duty cycle	On time (s/min)	Duty cycle	On time (s/min)	Duty cycle	On time (s/min)	Duty cycle	On time (s/min)	Duty cycle	On time (s/min)	Duty cycle	On time (s/min)	Duty cycle	On time (s/min)	Duty cycle
1	0.035	0.06	0.042	0.07	0.045	0.08	0.058	0.10	0.085	0.14	0.1	0.17	0.145	0.24	0.175	0.29	0.22	0.37
2	0.052	0.09	0.066	0.11	0.075	0.13	0.097	0.16	0.15	0.25	0.2	0.33	0.27	0.45	0.33	0.55	0.42	0.70
3	0.073	0.12	0.09	0.15	0.102	0.17	0.14	0.23	0.23	0.38	0.31	0.52	0.4	0.67	0.5	0.83	0.62	1.03
4	0.094	0.16	0.115	0.19	0.138	0.23	0.19	0.32	0.32	0.53	0.425	0.71	0.54	0.90	0.67	1.12	0.8	1.33
5	0.12	0.20	0.14	0.23	0.177	0.30	0.25	0.42	0.4	0.67	0.53	0.88	0.68	1.13	0.84	1.40	1.02	1.70
6	0.15	0.25	0.175	0.29	0.23	0.38	0.315	0.53	0.49	0.82	0.64	1.07	0.8	1.33	0.98	1.63	1.3	2.17
7	0.18	0.30	0.21	0.35	0.28	0.47	0.38	0.63	0.58	0.97	0.75	1.25	0.95	1.58	1.17	1.95	1.4	2.33
8	0.217	0.36	0.25	0.42	0.33	0.55	0.44	0.73	0.66	1.10	0.85	1.42	1.08	1.80	1.33	2.22	1.6	2.67
9	0.265	0.44	0.31	0.52	0.38	0.63	0.52	0.87	0.75	1.25	0.96	1.60	1.19	1.98	1.48	2.47	1.77	2.95
10	0.306	0.51	0.36	0.60	0.44	0.73	0.57	0.95	0.83	1.38	1.06	1.77	1.32	2.20	1.7	2.83	1.95	3.25
15	0.543	0.91	0.63	1.05	0.75	1.25	0.9	1.50	1.28	2.13	1.65	2.75	2	3.33	2.5	4.17	2.95	4.92
20	0.82	1.37	0.9	1.50	1.03	1.72	1.26	2.10	1.7	2.83	2.12	3.53	2.69	4.48	3.37	5.62	3.96	6.60
25	1.07	1.78	1.19	1.98	1.3	2.17	1.6	2.67	2.15	3.58	2.67	4.45	3.38	5.63	4.22	7.03	4.92	8.20
30	1.37	2.28	1.45	2.42	1.63	2.72	1.9	3.17	2.58	4.30	3.21	5.35	4.07	6.78	5.06	8.43	5.95	9.92
35	1.615	2.69	1.7	2.83	1.9	3.17	2.3	3.83	3.02	5.03	3.77	6.28	4.76	7.93	5.9	9.83	6.94	11.57
40	1.875	3.13	1.97	3.28	2.2	3.67	2.6	4.33	3.45	5.75	4.32	7.20	5.45	9.08	6.81	11.35	8.05	13.42
45	2.13	3.55	2.25	3.75	2.5	4.17	2.95	4.92	3.88	6.47	4.86	8.10	6.14	10.23	7.58	12.63	9	15.00
50	2.4	4.00	2.53	4.22	2.8	4.67	3.28	5.47	4.32	7.20	5.29	8.82	6.83	11.38	8.47	14.12	10.17	16.95
60	2.94	4.90	3.1	5.17	3.4	5.67	3.95	6.58	5.2	8.67	6.42	10.70	8.16	13.60	10.17	16.95	12.05	20.08
70	3.5	5.83	3.65	6.08	3.97	6.62	4.65	7.75	6.1	10.17	7.47	12.45	9.53	15.88	11.93	19.88	14.14	23.57
80	4	6.67	4.2	7.00	4.57	7.62	5.3	8.83	6.94	11.57	8.54	14.23	11	18.33	13.62	22.70	16.14	26.90
90	4.55	7.58	4.75	7.92	5.17	8.62	5.96	9.93	7.82	13.03	9.59	15.98	12.26	20.43	15.21	25.35	18.24	30.40
100	5.1	8.50	5.3	8.83	5.76	9.60	6.65	11.08	8.69	14.48	10.69	17.82	13.69	22.82	17.16	28.60	20.36	33.93
120	6.2	10.33	6.4	10.67	6.96	11.60	7.98	13.30	10.5	17.50	12.63	21.05	16.29	27.15	20.36	33.93	24.43	40.72
140	7.2	12.00	7.5	12.50	8.16	13.60	9.35	15.58	12.2	20.33	14.83	24.72	19.17	31.95	23.86	39.77	28.73	47.88
160	8.3	13.83	8.6	14.33	9.35	15.58	10.95	18.25	13.95	23.25	17.16	28.60	21.93	36.55	27.42	45.70	32.47	54.12
180	9.35	15.58	9.7	16.17	10.9	18.17	12.55	20.92	15.75	26.25	19.27	32.12	24.69	41.15	30.43	50.72	36.55	60.92
200	10.4	17.33	11.25	18.75	11.75	19.58	13.9	23.17	17.5	29.17	21.55	35.92	27.55	45.92	34.09	56.82	41.06	68.43
300	15.7	26.17	16.27	27.12	17.7	29.50	20.25	33.75	26.3	43.83	32.12	53.53	41.23	68.72	51.37	85.62		
400	21	35.00	21.8	36.33	23.3	38.83	26.6	44.33	35.05	58.42	43.17	71.95	55.35	92.25				
500	26.3	43.83	27.3	45.50	29.5	49.17	33.9	56.50	43.9	73.17	53.91	89.85						
600	31.6	52.67	32.7	54.50	35.6	59.33	40.7	67.83	51.4	85.67								
800	42.2	70.33	43.65	72.75	47.55	79.25	54.36	90.60										
1000	52.8	88.00	54.6	91.00	58.75	97.92												

Table 2 - Determine Stroke from Required Frequency and Duty Cycle

| | Frequency | | (TIME BETWEEN START CYCLES IN SECONDS = 60 / FREQUENCY) | | |

Frequency (TIME BETWEEN START CYCLES IN SECONDS = 60 / FREQUENCY)

Stroke	5	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9
0.1	0.83	0.85	0.87	0.88	0.90	0.92	0.93	0.95	0.97	0.98	1.00	1.02	1.03	1.05	1.07	1.08	1.10	1.12	1.13	1.15	1.17	1.18	1.20	1.22	1.23	1.25	1.27	1.28	1.30	1.32	1.33	1.35	1.37	1.38	1.40	1.42	1.43	1.45	1.47	1.48	1.50	1.52	1.53	1.55	1.57	1.58	1.60	1.62	1.63	1.65
0.2	1.67	1.70	1.73	1.77	1.80	1.83	1.87	1.90	1.93	1.97	2.00	2.03	2.07	2.10	2.13	2.17	2.20	2.23	2.27	2.30	2.33	2.37	2.40	2.43	2.47	2.50	2.53	2.57	2.60	2.63	2.67	2.70	2.73	2.77	2.80	2.83	2.87	2.90	2.93	2.97	3.00	3.03	3.07	3.10	3.13	3.17	3.20	3.23	3.27	3.30
0.3	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00	4.05	4.10	4.15	4.20	4.25	4.30	4.35	4.40	4.45	4.50	4.55	4.60	4.65	4.70	4.75	4.80	4.85	4.90	4.95
0.4	3.33	3.40	3.47	3.53	3.60	3.67	3.73	3.80	3.87	3.93	4.00	4.07	4.13	4.20	4.27	4.33	4.40	4.47	4.53	4.60	4.67	4.73	4.80	4.87	4.93	5.00	5.07	5.13	5.20	5.27	5.33	5.40	5.47	5.53	5.60	5.67	5.73	5.80	5.87	5.93	6.00	6.07	6.13	6.20	6.27	6.33	6.40	6.47	6.53	6.60
0.5	4.17	4.25	4.33	4.42	4.50	4.58	4.67	4.75	4.83	4.92	5.00	5.08	5.17	5.25	5.33	5.42	5.50	5.58	5.67	5.75	5.83	5.92	6.00	6.08	6.17	6.25	6.33	6.42	6.50	6.58	6.67	6.75	6.83	6.92	7.00	7.08	7.17	7.25	7.33	7.42	7.50	7.58	7.67	7.75	7.83	7.92	8.00	8.08	8.17	8.25
0.6	5.00	5.10	5.20	5.30	5.40	5.50	5.60	5.70	5.80	5.90	6.00	6.10	6.20	6.30	6.40	6.50	6.60	6.70	6.80	6.90	7.00	7.10	7.20	7.30	7.40	7.50	7.60	7.70	7.80	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.90	9.00	9.10	9.20	9.30	9.40	9.50	9.60	9.70	9.80	9.90
0.7	5.83	5.95	6.07	6.18	6.30	6.42	6.53	6.65	6.77	6.88	7.00	7.12	7.23	7.35	7.47	7.58	7.70	7.82	7.93	8.05	8.17	8.28	8.40	8.52	8.63	8.75	8.87	8.98	9.10	9.22	9.33	9.45	9.57	9.68	9.80	9.92	10.03	10.15	10.27	10.38	10.50	10.62	10.73	10.85	10.97	11.08	11.20	11.32	11.43	11.55
0.8	6.67	6.80	6.93	7.07	7.20	7.33	7.47	7.60	7.73	7.87	8.00	8.13	8.27	8.40	8.53	8.67	8.80	8.93	9.07	9.20	9.33	9.47	9.60	9.73	9.87	10.00	10.13	10.27	10.40	10.53	10.67	10.80	10.93	11.07	11.20	11.33	11.47	11.60	11.73	11.87	12.00	12.13	12.27	12.40	12.53	12.67	12.80	12.93	13.07	13.20
0.9	7.50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85	9.00	9.15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10.35	10.50	10.65	10.80	10.95	11.10	11.25	11.40	11.55	11.70	11.85	12.00	12.15	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35	13.50	13.65	13.80	13.95	14.10	14.25	14.40	14.55	14.70	14.85
1	8.33	8.50	8.67	8.83	9.00	9.17	9.33	9.50	9.67	9.83	10.00	10.17	10.33	10.50	10.67	10.83	11.00	11.17	11.33	11.50	11.67	11.83	12.00	12.17	12.33	12.50	12.67	12.83	13.00	13.17	13.33	13.50	13.67	13.83	14.00	14.17	14.33	14.50	14.67	14.83	15.00	15.17	15.33	15.50	15.67	15.83	16.00	16.17	16.33	16.50
1.1	9.17	9.35	9.53	9.72	9.90	10.08	10.27	10.45	10.63	10.82	11.00	11.18	11.37	11.55	11.73	11.92	12.10	12.28	12.47	12.65	12.83	13.02	13.20	13.38	13.57	13.75	13.93	14.12	14.30	14.48	14.67	14.85	15.03	15.22	15.40	15.58	15.77	15.95	16.13	16.32	16.50	16.68	16.87	17.05	17.23	17.42	17.60	17.78	17.97	18.15
1.2	10.00	10.20	10.40	10.60	10.80	11.00	11.20	11.40	11.60	11.80	12.00	12.20	12.40	12.60	12.80	13.00	13.20	13.40	13.60	13.80	14.00	14.20	14.40	14.60	14.80	15.00	15.20	15.40	15.60	15.80	16.00	16.20	16.40	16.60	16.80	17.00	17.20	17.40	17.60	17.80	18.00	18.20	18.40	18.60	18.80	19.00	19.20	19.40	19.60	19.80
1.3	10.83	11.05	11.27	11.48	11.70	11.92	12.13	12.35	12.57	12.78	13.00	13.22	13.43	13.65	13.87	14.08	14.30	14.52	14.73	14.95	15.17	15.38	15.60	15.82	16.03	16.25	16.47	16.68	16.90	17.12	17.33	17.55	17.77	17.98	18.20	18.42	18.63	18.85	19.07	19.28	19.50	19.72	19.93	20.15	20.37	20.58	20.80	21.02	21.23	21.45
1.4	11.67	11.90	12.13	12.37	12.60	12.83	13.07	13.30	13.53	13.77	14.00	14.23	14.47	14.70	14.93	15.17	15.40	15.63	15.87	16.10	16.33	16.57	16.80	17.03	17.27	17.50	17.73	17.97	18.20	18.43	18.67	18.90	19.13	19.37	19.60	19.83	20.07	20.30	20.53	20.77	21.00	21.23	21.47	21.70	21.93	22.17	22.40	22.63	22.87	23.10
1.5	12.50	12.75	13.00	13.25	13.50	13.75	14.00	14.25	14.50	14.75	15.00	15.25	15.50	15.75	16.00	16.25	16.50	16.75	17.00	17.25	17.50	17.75	18.00	18.25	18.50	18.75	19.00	19.25	19.50	19.75	20.00	20.25	20.50	20.75	21.00	21.25	21.50	21.75	22.00	22.25	22.50	22.75	23.00	23.25	23.50	23.75	24.00	24.25	24.50	24.75
1.6	13.33	13.60	13.87	14.13	14.40	14.67	14.93	15.20	15.47	15.73	16.00	16.27	16.53	16.80	17.07	17.33	17.60	17.87	18.13	18.40	18.67	18.93	19.20	19.47	19.73	20.00	20.27	20.53	20.80	21.07	21.33	21.60	21.87	22.13	22.40	22.67	22.93	23.20	23.47	23.73	24.00	24.27	24.53	24.80	25.07	25.33	25.60	25.87	26.13	26.40
1.7	14.17	14.45	14.73	15.02	15.30	15.58	15.87	16.15	16.43	16.72	17.00	17.28	17.57	17.85	18.13	18.42	18.70	18.98	19.27	19.55	19.83	20.12	20.40	20.68	20.97	21.25	21.53	21.82	22.10	22.38	22.67	22.95	23.23	23.52	23.80	24.08	24.37	24.65	24.93	25.22	25.50	25.78	26.07	26.35	26.63	26.92	27.20	27.48	27.77	28.05
1.8	15.00	15.30	15.60	15.90	16.20	16.50	16.80	17.10	17.40	17.70	18.00	18.30	18.60	18.90	19.20	19.50	19.80	20.10	20.40	20.70	21.00	21.30	21.60	21.90	22.20	22.50	22.80	23.10	23.40	23.70	24.00	24.30	24.60	24.90	25.20	25.50	25.80	26.10	26.40	26.70	27.00	27.30	27.60	27.90	28.20	28.50	28.80	29.10	29.40	29.70
1.9	15.83	16.15	16.47	16.78	17.10	17.42	17.73	18.05	18.37	18.68	19.00	19.32	19.63	19.95	20.27	20.58	20.90	21.22	21.53	21.85	22.17	22.48	22.80	23.12	23.43	23.75	24.07	24.38	24.70	25.02	25.33	25.65	25.97	26.28	26.60	26.92	27.23	27.55	27.87	28.18	28.50	28.82	29.13	29.45	29.77	30.08	30.40	30.72	31.03	31.35
2	16.67	17.00	17.33	17.67	18.00	18.33	18.67	19.00	19.33	19.67	20.00	20.33	20.67	21.00	21.33	21.67	22.00	22.33	22.67	23.00	23.33	23.67	24.00	24.33	24.67	25.00	25.33	25.67	26.00	26.33	26.67	27.00	27.33	27.67	28.00	28.33	28.67	29.00	29.33	29.67	30.00	30.33	30.67	31.00	31.33	31.67	32.00	32.33	32.67	33.00
2.1	17.50	17.85	18.20	18.55	18.90	19.25	19.60	19.95	20.30	20.65	21.00	21.35	21.70	22.05	22.40	22.75	23.10	23.45	23.80	24.15	24.50	24.85	25.20	25.55	25.90	26.25	26.60	26.95	27.30	27.65	28.00	28.35	28.70	29.05	29.40	29.75	30.10	30.45	30.80	31.15	31.50	31.85	32.20	32.55	32.90	33.25	33.60	33.95	34.30	34.65
2.2	18.33	18.70	19.07	19.43	19.80	20.17	20.53	20.90	21.27	21.63	22.00	22.37	22.73	23.10	23.47	23.83	24.20	24.57	24.93	25.30	25.67	26.03	26.40	26.77	27.13	27.50	27.87	28.23	28.60	28.97	29.33	29.70	30.07	30.43	30.80	31.17	31.53	31.90	32.27	32.63	33.00	33.37	33.73	34.10	34.47	34.83	35.20	35.57	35.93	36.30
2.3	19.17	19.55	19.93	20.32	20.70	21.08	21.47	21.85	22.23	22.62	23.00	23.38	23.77	24.15	24.53	24.92	25.30	25.68	26.07	26.45	26.83	27.22	27.60	27.98	28.37	28.75	29.13	29.52	29.90	30.28	30.67	31.05	31.43	31.82	32.20	32.58	32.97	33.35	33.73	34.12	34.50	34.88	35.27	35.65	36.03	36.42	36.80	37.18	37.57	37.95
2.4	20.00	20.40	20.80	21.20	21.60	22.00	22.40	22.80	23.20	23.60	24.00	24.40	24.80	25.20	25.60	26.00	26.40	26.80	27.20	27.60	28.00	28.40	28.80	29.20	29.60	30.00	30.40	30.80	31.20	31.60	32.00	32.40	32.80	33.20	33.60	34.00	34.40	34.80	35.20	35.60	36.00	36.40	36.80	37.20	37.60	38.00	38.40	38.80	39.20	39.60
2.5	20.83	21.25	21.67	22.08	22.50	22.92	23.33	23.75	24.17	24.58	25.00	25.42	25.83	26.25	26.67	27.08	27.50	27.92	28.33	28.75	29.17	29.58	30.00	30.42	30.83	31.25	31.67	32.08	32.50	32.92	33.33	33.75	34.17	34.58	35.00	35.42	35.83	36.25	36.67	37.08	37.50	37.92	38.33	38.75	39.17	39.58	40.00	40.42	40.83	41.25
2.6	21.67	22.10	22.53	22.97	23.40	23.83	24.27	24.70	25.13	25.57	26.00	26.43	26.87	27.30	27.73	28.17	28.60	29.03	29.47	29.90	30.33	30.77	31.20	31.63	32.07	32.50	32.93	33.37	33.80	34.23	34.67	35.10	35.53	35.97	36.40	36.83	37.27	37.70	38.13	38.57	39.00	39.43	39.87	40.30	40.73	41.17	41.60	42.03	42.47	42.90
2.7	22.50	22.95	23.40	23.85	24.30	24.75	25.20	25.65	26.10	26.55	27.00	27.45	27.90	28.35	28.80	29.25	29.70	30.15	30.60	31.05	31.50	31.95	32.40	32.85	33.30	33.75	34.20	34.65	35.10	35.55	36.00	36.45	36.90	37.35	37.80	38.25	38.70	39.15	39.60	40.05	40.50	40.95	41.40	41.85	42.30	42.75	43.20	43.65	44.10	44.55
2.8	23.33	23.80	24.27	24.73	25.20	25.67	26.13	26.60	27.07	27.53	28.00	28.47	28.93	29.40	29.87	30.33	30.80	31.27	31.73	32.20	32.67	33.13	33.60	34.07	34.53	35.00	35.47	35.93	36.40	36.87	37.33	37.80	38.27	38.73	39.20	39.67	40.13	40.60	41.07	41.53	42.00	42.47	42.93	43.40	43.87	44.33	44.80	45.27	45.73	46.20
2.9	24.17	24.65	25.13	25.62	26.10	26.58	27.07	27.55	28.03	28.52	29.00	29.48	29.97	30.45	30.93	31.42	31.90	32.38	32.87	33.35	33.83	34.32	34.80	35.28	35.77	36.25	36.73	37.22	37.70	38.18	38.67	39.15	39.63	40.12	40.60	41.08	41.57	42.05	42.53	43.02	43.50	43.98	44.47	44.95	45.43	45.92	46.40	46.88	47.37	47.85
3	25.00	25.50	26.00	26.50	27.00	27.50	28.00	28.50	29.00	29.50	30.00	30.50	31.00	31.50	32.00	32.50	33.00	33.50	34.00	34.50	35.00	35.50	36.00	36.50	37.00	37.50	38.00	38.50	39.00	39.50	40.00	40.50	41.00	41.50	42.00	42.50	43.00	43.50	44.00	44.50	45.00	45.50	46.00	46.50	47.00	47.50	48.00	48.50	49.00	49.50
3.1	25.83	26.35	26.87	27.38	27.90	28.42	28.93	29.45	29.97	30.48	31.00	31.52	32.03	32.55	33.07	33.58	34.10	34.62	35.13	35.65	36.17	36.68	37.20	37.72	38.23	38.75	39.27	39.78	40.30	40.82	41.33	41.85	42.37	42.88	43.40	43.92	44.43	44.95	45.47	45.98	46.50	47.02	47.53	48.05	48.57	49.08	49.60	50.12	50.63	51.15
3.2	26.67	27.20	27.73	28.27	28.80	29.33	29.87	30.40	30.93	31.47	32.00	32.53	33.07	33.60	34.13	34.67	35.20	35.73	36.27	36.80	37.33	37.87	38.40	38.93	39.47	40.00	40.53	41.07	41.60	42.13	42.67	43.20	43.73	44.27	44.80	45.33	45.87	46.40	46.93	47.47	48.00	48.53	49.07	49.60	50.13	50.67	51.20	51.73	52.27	52.80
3.3	27.50	28.05	28.60	29.15	29.70	30.25	30.80	31.35	31.90	32.45	33.00	33.55	34.10	34.65	35.20	35.75	36.30	36.85	37.40	37.95	38.50	39.05	39.60	40.15	40.70	41.25	41.80	42.35	42.90	43.45	44.00	44.55	45.10	45.65	46.20	46.75	47.30	47.85	48.40	48.95	49.50	50.05	50.60	51.15	51.70	52.25	52.80	53.35	53.90	54.45
3.4	28.33	28.90	29.47	30.03	30.60	31.17	31.73	32.30	32.87	33.43	34.00	34.57	35.13	35.70	36.27	36.83	37.40	37.97	38.53	39.10	39.67	40.23	40.80	41.37	41.93	42.50	43.07	43.63	44.20	44.77	45.33	45.90	46.47	47.03	47.60	48.17	48.73	49.30	49.87	50.43	51.00	51.57	52.13	52.70	53.27	53.83	54.40	54.97	55.53	56.10
3.5	29.17	29.75	30.33	30.92	31.50	32.08	32.67	33.25	33.83	34.42	35.00	35.58	36.17	36.75	37.33	37.92	38.50	39.08	39.67	40.25	40.83	41.42	42.00	42.58	43.17	43.75	44.33	44.92	45.50	46.08	46.67	47.25	47.83	48.42	49.00	49.58	50.17	50.75	51.33	51.92	52.50	53.08	53.67	54.25	54.83	55.42	56.00	56.58	57.17	57.75
3.6	30.00	30.60	31.20	31.80	32.40	33.00	33.60	34.20	34.80	35.40	36.00	36.60	37.20	37.80	38.40	39.00	39.60	40.20	40.80	41.40	42.00	42.60	43.20	43.80	44.40	45.00	45.60	46.20	46.80	47.40	48.00	48.60	49.20	49.80	50.40	51.00	51.60	52.20	52.80	53.40	54.00	54.60	55.20	55.80	56.40	57.00	57.60	58.20	58.80	59.40
3.7	30.83	31.45	32.07	32.68	33.30	33.92	34.53	35.15	35.77	36.38	37.00	37.62	38.23	38.85	39.47	40.08	40.70	41.32	41.93	42.55	43.17	43.78	44.40	45.02	45.63	46.25	46.87	47.48	48.10	48.72	49.33	49.95	50.57	51.18	51.80	52.42	53.03	53.65	54.27	54.88	55.50	56.12	56.73	57.35	57.97	58.58	59.20	59.82	60.43	61.05
3.8	31.67	32.30	32.93	33.57	34.20	34.83	35.47	36.10	36.73	37.37	38.00	38.63	39.27	39.90	40.53	41.17	41.80	42.43	43.07	43.70	44.33	44.97	45.60	46.23	46.87	47.50	48.13	48.77	49.40	50.03	50.67	51.30	51.93	52.57	53.20	53.83	54.47	55.10	55.73	56.37	57.00	57.63	58.27	58.90	59.53	60.17	60.80	61.43	62.07	62.70
3.9	32.50	33.15	33.80	34.45	35.10	35.75	36.40	37.05	37.70	38.35	39.00	39.65	40.30	40.95	41.60	42.25	42.90	43.55	44.20	44.85	45.50	46.15	46.80	47.45	48.10	48.75	49.40	50.05	50.70	51.35	52.00	52.65	53.30	53.95	54.60	55.25	55.90	56.55	57.20	57.85	58.50	59.15	59.80	60.45	61.10	61.75	62.40	63.05	63.70	64.35
4	33.33	34.00	34.67	35.33	36.00	36.67	37.33	38.00	38.67	39.33	40.00	40.67	41.33	42.00	42.67	43.33	44.00	44.67	45.33	46.00	46.67	47.33	48.00	48.67	49.33	50.00	50.67	51.33	52.00	52.67	53.33	54.00	54.67	55.33	56.00	56.67	57.33	58.00	58.67	59.33	60.00	60.67	61.33	62.00	62.67	63.33	64.00	64.67	65.33	66.00
4.1	34.17	34.85	35.53	36.22	36.90	37.58	38.27	38.95	39.63	40.32	41.00	41.68	42.37	43.05	43.73	44.42	45.10	45.78	46.47	47.15	47.83	48.52	49.20	49.88	50.57	51.25	51.93	52.62	53.30	53.98	54.67	55.35	56.03	56.72	57.40	58.08	58.77	59.45	60.13	60.82	61.50	62.18	62.87	63.55	64.23	64.92	65.60	66.28	66.97	67.65
4.2	35.00	35.70	36.40	37.10	37.80	38.50	39.20	39.90	40.60	41.30	42.00	42.70	43.40	44.10	44.80	45.50	46.20	46.90	47.60	48.30	49.00	49.70	50.40	51.10	51.80	52.50	53.20	53.90	54.60	55.30	56.00	56.70	57.40	58.10	58.80	59.50	60.20	60.90	61.60	62.30	63.00	63.70	64.40	65.10	65.80	66.50	67.20	67.90	68.60	69.30
4.3	35.83	36.55	37.27	37.98	38.70	39.42	40.13	40.85	41.57	42.28	43.00	43.72	44.43	45.15	45.87	46.58	47.30	48.02	48.73	49.45	50.17	50.88	51.60	52.32	53.03	53.75	54.47	55.18	55.90	56.62	57.33	58.05	58.77	59.48	60.20	60.92	61.63	62.35	63.07	63.78	64.50	65.22	65.93	66.65	67.37	68.08	68.80	69.52	70.23	70.95
4.4	36.67	37.40	38.13	38.87	39.60	40.33	41.07	41.80	42.53	43.27	44.00	44.73	45.47	46.20	46.93	47.67	48.40	49.13	49.87	50.60	51.33	52.07	52.80	53.53	54.27	55.00	55.73	56.47	57.20	57.93	58.67	59.40	60.13	60.87	61.60	62.33	63.07	63.80	64.53	65.27	66.00	66.73	67.47	68.20	68.93	69.67	70.40	71.13	71.87	72.60
4.5	37.50	38.25	39.00	39.75	40.50	41.25	42.00	42.75	43.50	44.25	45.00	45.75	46.50	47.25	48.00	48.75	49.50	50.25	51.00	51.75	52.50	53.25	54.00	54.75	55.50	56.25	57.00	57.75	58.50	59.25	60.00	60.75	61.50	62.25	63.00	63.75	64.50	65.25	66.00	66.75	67.50	68.25	69.00	69.75	70.50	71.25	72.00	72.75	73.50	74.25
4.6	38.33	39.10	39.87	40.63	41.40	42.17	42.93	43.70	44.47	45.23	46.00	46.77	47.53	48.30	49.07	49.83	50.60	51.37	52.13	52.90	53.67	54.43	55.20	55.97	56.73	57.50	58.27	59.03	59.80	60.57	61.33	62.10	62.87	63.63	64.40	65.17	65.93	66.70	67.47	68.23	69.00	69.77	70.53	71.30	72.07	72.83	73.60	74.37	75.13	75.90
4.7	39.17	39.95	40.73	41.52	42.30	43.08	43.87	44.65	45.43	46.22	47.00	47.78	48.57	49.35	50.13	50.92	51.70	52.48	53.27	54.05	54.83	55.62	56.40	57.18	57.97	58.75	59.53	60.32	61.10	61.88	62.67	63.45	64.23	65.02	65.80	66.58	67.37	68.15	68.93	69.72	70.50	71.28	72.07	72.85	73.63	74.42	75.20	75.98	76.77	77.55
4.8	40.00	40.80	41.60	42.40	43.20	44.00	44.80	45.60	46.40	47.20	48.00	48.80	49.60	50.40	51.20	52.00	52.80	53.60	54.40	55.20	56.00	56.80	57.60	58.40	59.20	60.00	60.80	61.60	62.40	63.20	64.00	64.80	65.60	66.40	67.20	68.00	68.80	69.60	70.40	71.20	72.00	72.80	73.60	74.40	75.20	76.00	76.80	77.60	78.40	79.20
4.9	40.83	41.65	42.47	43.28	44.10	44.92	45.73	46.55	47.37	48.18	49.00	49.82	50.63	51.45	52.27	53.08	53.90	54.72	55.53	56.35	57.17	57.98	58.80	59.62	60.43	61.25	62.07	62.88	63.70	64.52	65.33	66.15	66.97	67.78	68.60	69.42	70.23	71.05	71.87	72.68	73.50	74.32	75.13	75.95	76.77	77.58	78.40	79.22	80.03	80.85
5	41.67	42.50	43.33	44.17	45.00	45.83	46.67	47.50	48.33	49.17	50.00	50.83	51.67	52.50	53.33	54.17	55.00	55.83	56.67	57.50	58.33	59.17	60.00	60.83	61.67	62.50	63.33	64.17	65.00	65.83	66.67	67.50	68.33	69.17	70.00	70.83	71.67	72.50	73.33	74.17	75.00	75.83	76.67	77.50	78.33	79.17	80.00	80.83	81.67	82.50
5.1	42.50	43.35	44.20	45.05	45.90	46.75	47.60	48.45	49.30	50.15	51.00	51.85	52.70	53.55	54.40	55.25	56.10	56.95	57.80	58.65	59.50	60.35	61.20	62.05	62.90	63.75	64.