

Math 255 - Spring 2022  
The sieve of Eratosthenes  
5 points

This assignment invites you to read about the sieve of Eratosthenes, and then to solve a short problem to demonstrate what you have learned.

You can read about the sieve of Eratosthenes anywhere you would like, but our textbook discusses it in Section 2. The explanation starts immediately after Lemma 4, on page 13, and ends before Lemma 5, on page 15.

Now we will use the sieve of Eratosthenes to find all of the primes that are less than 200.

1. According to the book, to find all primes less than  $N^2$ , it suffices to eliminate the multiples of all of the primes that are less than or equal to  $N$ . Let  $N$  be the **integer** such that, to find all primes that are less than 200, we must eliminate all of the multiples of all of the primes that are less than or equal to  $N$ . What is  $N$  here?
2. Use the sieve of Eratosthenes to find all of the primes that are less than 200. You may use the grid below, and you may give your answer to this question as the grid with all primes circled.

	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200