

# PROBLEM INDEX

It is very difficult to categorize many of the problems in this handbook. MATHCOUNTS problems often straddle multiple categories and cover several concepts, but in this index, we have placed each problem in exactly one category and mapped it to exactly one Common Core State Standard (CCSS). **In this index, code 9 (3) 7.SP.3 would refer to problem #9 with difficulty rating 3 mapped to CCSS 7.SP.3.** The difficulty rating and CCSS mapping are explained below.

**DIFFICULTY RATING:** Our scale is 1-7, with 7 being most difficult. These general ratings are only approximations:

- **1, 2 or 3:** Appropriate for students just starting the middle school curriculum; 1 concept; 1- or 2-step solution.
- **4 or 5:** Knowledge of some middle school topics necessary; 1-2 concepts; multi-step solution.
- **6 or 7:** Knowledge of advanced middle school topics and/or problem-solving strategies necessary; multiple and/or advanced concepts; multi-step solution.

**COMMON CORE:** We align our problems to the NCTM Standards for Grades 6-8, however we also have mapped these problems to CCSS because 42 states, D.C., 4 territories and the Dept. of Defense Education Activity (DoDEA) have voluntarily adopted it. Our CCSS codes contain (in this order):

- 1. Grade level** in the K-8 Standards for Mathematical Content (SMC). Courses that are in the high school SMC instead have the first letter of the course name.
- 2. Domain** within the grade level or course and then the **individual standard**.

Here are 2 examples:

- *6.RP.3* → *Standard #3 in the Ratios and Proportional Relationships domain of grade 6*
- *G-SRT.6* → *Standard #6 in the Similarity, Right Triangles and Trigonometry domain of Geometry*

Some math concepts are not specifically mentioned in CCSS. For problems using these concepts, we use the code of a related standard, when possible. Some of our problems are based on concepts outside the scope of CCSS or are based on concepts in the K-5 SMC but are more difficult than a grade K-5 problem. When appropriate, we coded these problems SMP for the CCSS Standards for Mathematical Practice.



## COORDINATE GEOMETRY

69	(2)	6.NS.8
92	(4)	8.F.3
100	(3)	8.F.4
163	(4)	8.F.4
190	(4)	8.F.1
197	(4)	8.G.1
204	(4)	G-GPE.6
215	(4)	8.G.1
223	(5)	8.G.8



## MEASUREMENT

35	(1)	6.EE.3
48	(2)	6.G.1
57	(3)	4.MD.2
61	(3)	6.EE.7
97	(4)	6.NS.8
132	(4)	7.G.1
134	(5)	G-SRT.6
157	(3)	6.SP.3
170	(4)	6.RP.3
193	(4)	8.G.5
211	(4)	6.EE.7



## ALGEBRAIC EXPRESSIONS & EQUATIONS

4	(5)	6.RP.3
15	(5)	7.EE.2
34	(2)	6.EE.6
38	(2)	6.EE.6
40	(1)	6.EE.2
41	(3)	6.EE.6
44	(3)	SMP
54	(3)	6.EE.7
58	(2)	6.EE.7
62	(3)	SMP
70	(3)	SMP
72	(4)	A-REI.4
73	(3)	6.EE.2
76	(3)	6.EE.6
94	(3)	SMP
99	(4)	F-IF.2
109	(5)	8.EE.8
122	(4)	8.EE.8
126	(3)	SMP
130	(4)	A-APR.3
135	(4)	A-REI.4
140	(5)	A-REI.4
147	(2)	6.EE.2
149	(3)	SMP
151	(3)	A-REI.5
171	(3)	SMP
173	(3)	5.NF.6
202	(4)	8.EE.1
207	(4)	A-APR.5
212	(5)	6.RP.3
214	(5)	A-REI.2
216	(4)	6.NS.4
222	(5)	A-APR.3
224	(7)	SMP
227	(5)	A-REI.7
231	(3)	6.EE.9
232	(4)	A-REI.4
242	(5)	A-SSE.4



## PLANE GEOMETRY

21	(4)	6.RP.1
22	(3)	8.G.7
23	(6)	8.G.7
24	(3)	7.G.6
25	(4)	6.EE.6
26	(5)	G-GPE.6
27	(6)	7.G.1
28	(3)	G-SRT.4
29	(4)	G-SRT.4
30	(5)	SMP
79	(3)	7.G.4
82	(4)	8.G.7
84	(3)	4.MD.3
108	(4)	SMP
120	(5)	G-SRT.6
128	(4)	SMP
159	(2)	7.G.4
177	(3)	G-C.5
188	(5)	7.G.6
206	(5)	SMP
219	(6)	G-SRT.6
229	(5)	G-SRT.6
230	(6)	8.G.7
234	(6)	G-SRT.6
249	(6)	G-SRT.6



## SOLID GEOMETRY

64	(3)	SMP
101	(3)	7.G.6
112	(3)	7.G.6
144	(3)	7.G.6
158	(2)	7.G.6
180	(3)	7.G.6
200	(5)	7.G.6
236	(6)	G-SRT.6

**STATISTICS & DATA**

56	(2)	F-BF.2
68	(2)	6.SP.4
116	(3)	6.SP.2
121	(4)	G-CO.10
124	(4)	6.SP.2
148	(3)	6.SP.4
155	(2)	6.SP.2
166	(3)	7.NS.3
168	(2)	6.SP.2
178	(4)	6.SP.2
192	(3)	6.SP.2
209	(4)	A-REI.4
245	(3)	6.SP.2

**PROBLEM SOLVING  
(MISCELLANEOUS)**

9	(5)	6.RP.3
31	(2)	SMP
47	(2)	4.OA.3
75	(3)	SMP
80	(2)	6.RP.3
95	(3)	SMP
96	(3)	SMP
114	(5)	7.RP.1
137	(4)	F-BF.2
142	(1)	F-BF.2
167	(3)	SMP
174	(2)	SMP
175	(3)	6.RP.1
184	(4)	SMP
199	(4)	7.RP.3
233	(3)	SMP

**LOGIC**

74	(4)	8.EE.8
85	(4)	SMP
103	(3)	6.NS.4
145	(3)	SMP
150	(4)	SMP
172	(4)	6.NS.4
182	(3)	6.RP.3
238	(4)	SMP
247	(3)	7.NS.3

**PERCENTS &  
FRACTIONS**

36	(2)	6.EE.6
43	(2)	3.NF.2
55	(2)	5.NF.4
65	(3)	6.NS.3
71	(3)	5.NF.3
81	(2)	7.RP.3
106	(3)	6.RP.3
118	(3)	7.NS.3
141	(1)	A-SSE.3
152	(4)	7.RP.1
164	(2)	7.NS.2
165	(3)	7.RP.3
169	(3)	6.RP.3
185	(3)	6.RP.3
208	(4)	5.NF.6

**PROPORTIONAL  
REASONING**

1	(4)	6.RP.3
2	(3)	6.RP.3
3	(3)	6.RP.3
5	(2)	6.RP.3
6	(3)	6.RP.3
7	(3)	6.RP.3
8	(4)	6.RP.3
10	(5)	6.RP.3
42	(3)	7.G.1
52	(2)	7.G.1
59	(2)	7.RP.1
63	(4)	6.RP.3
87	(3)	SMP
131	(4)	6.RP.3
143	(1)	7.G.1
153	(2)	6.RP.3
156	(3)	SMP
160	(3)	SMP
161	(3)	6.RP.3
176	(4)	6.RP.3
183	(5)	G-SRT.5
186	(3)	6.RP.3
187	(4)	6.RP.3
191	(3)	7.RP.3
228	(5)	7.RP.1
243	(4)	7.RP.1

**PROBABILITY,  
COUNTING &  
COMBINATORICS**

32	(2)	S-CP.9
51	(2)	S-CP.9
83	(4)	7.SP.7
98	(5)	S-CP.3
110	(4)	S-MD.2
111	(5)	S-CP.9
125	(4)	S-CP.9
133	(4)	6.NS.4
139	(3)	S-CP.2
154	(2)	S-CP.2
179	(4)	S-CP.1
195	(4)	S-CP.6
198	(5)	S-CP.3
201	(4)	S-CP.9
217	(4)	S-CP.3
218	(5)	SMP
221	(5)	S-CP.9
237	(5)	SMP
239	(7)	S-CP.6
241	(5)	S-CP.9
246	(5)	S-MD.2
250	(7)	S-MD.2

**SEQUENCES,  
SERIES & PATTERNS**

37	(2)	F-BF.2
50	(3)	F-BF.2
77	(3)	F-BF.2
107	(4)	F-BF.2
117	(3)	F-BF.2
123	(4)	F-BF.2
127	(4)	4.OA.3
138	(4)	6.NS.4
194	(6)	SMP
213	(4)	6.SP.2
225	(3)	6.NS.1

**NUMBER THEORY**

11	(2)	7.EE.2
12	(3)	7.EE.2
13	(3)	7.EE.2
14	(3)	7.EE.2
16	(2)	6.NS.4
17	(2)	SMP
18	(2)	7.EE.2
19	(6)	7.EE.2
20	(6)	SMP
33	(1)	6.NS.4
39	(2)	7.G.1
45	(3)	5.NBT.2
46	(1)	6.NS.4
49	(2)	6.NS.4
53	(2)	SMP
60	(3)	SMP
66	(2)	SMP
67	(3)	6.NS.4
78	(3)	N-RN.1
86	(3)	SMP
88	(3)	A-SSE.2
89	(2)	7.RP.1
90	(4)	SMP
91	(2)	4.OA.2
93	(3)	6.NS.4
102	(2)	SMP
104	(4)	6.NS.4
105	(4)	SMP
113	(3)	7.EE.2
115	(5)	7.EE.2
119	(5)	SMP
129	(5)	6.NS.4
136	(5)	SMP
146	(3)	6.RP.3
162	(3)	7.NS.2
181	(3)	4.OA.5
189	(4)	SMP
196	(5)	SMP
203	(6)	6.EE.7
205	(4)	SMP
210	(5)	SMP
220	(6)	A-REI.4
226	(3)	SMP
235	(2)	SMP
240	(6)	6.NS.4
244	(6)	SMP
248	(4)	SMP

**COACHES:**  
**FIND SOLUTIONS FOR PROBLEMS 201-250**  
**at [www.mathcounts.org/coaches!](http://www.mathcounts.org/coaches!)**