

an

AMID  ON
A PLANET

production

Got problems?

Joel Amidon, Ph.D.
University of Mississippi



Got problems, or exercises?

Joel Amidon, Ph.D.
University of Mississippi



Standards for Mathematical Practice

Make sense of problems and persevere in solving them.

Reason abstractly and quantitatively.

Construct viable arguments and critique the reasoning of others.

Model with mathematics.

Use appropriate tools strategically.

Attend to precision.

Look for and make use of structure.

Look for and express regularity in repeated reasoning.

1. Make sense of problems and persevere in solving them
6. Attend to precision

2. Reason abstractly and quantitatively

3. Construct viable arguments and critique the reasoning of others

4. Model with mathematics

5. Use appropriate tools strategically

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.



Reasoning and explaining



Modeling and using tools



Seeing structure and generalizing



Overarching habits of mind of a productive mathematical thinker.

Problem v Exercise

Problem v Exercise

Difficult Task

Varied level of difficulty

Problem v Exercise

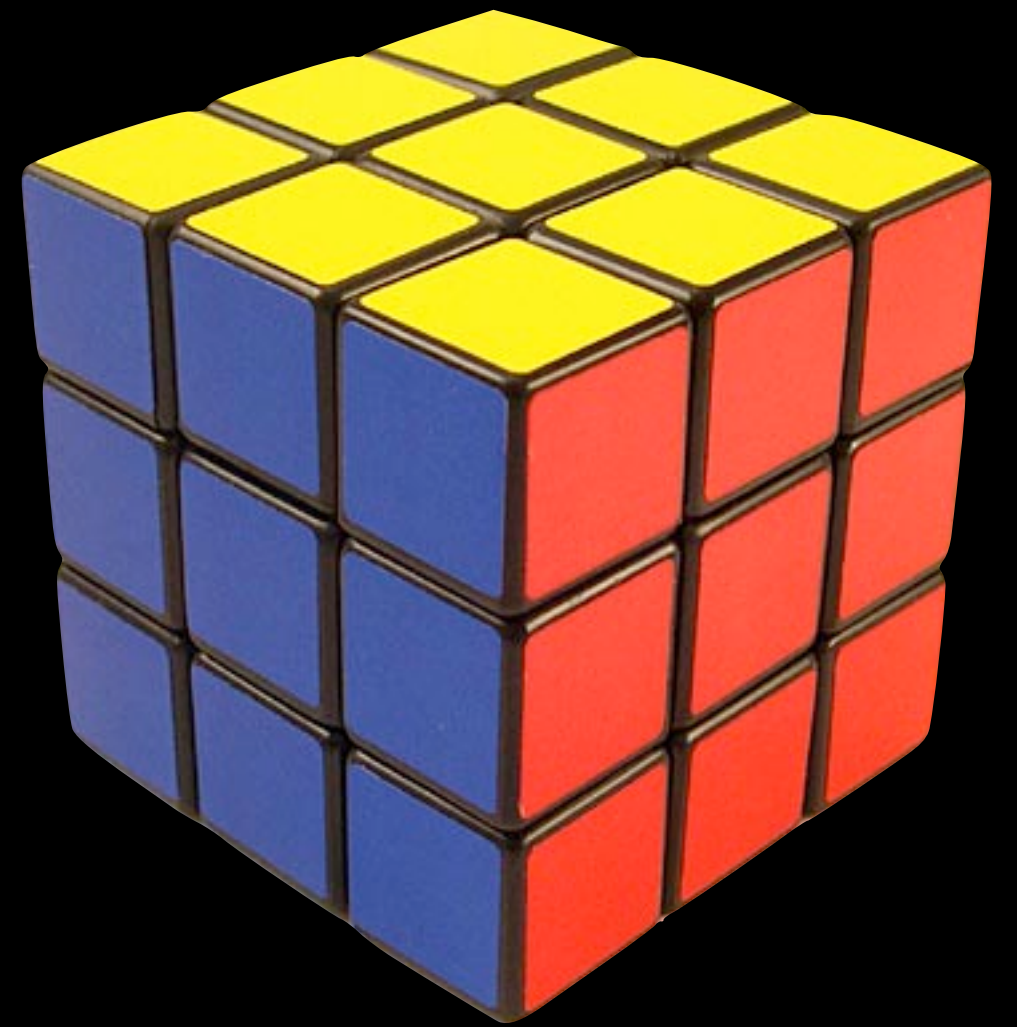
Difficult Task

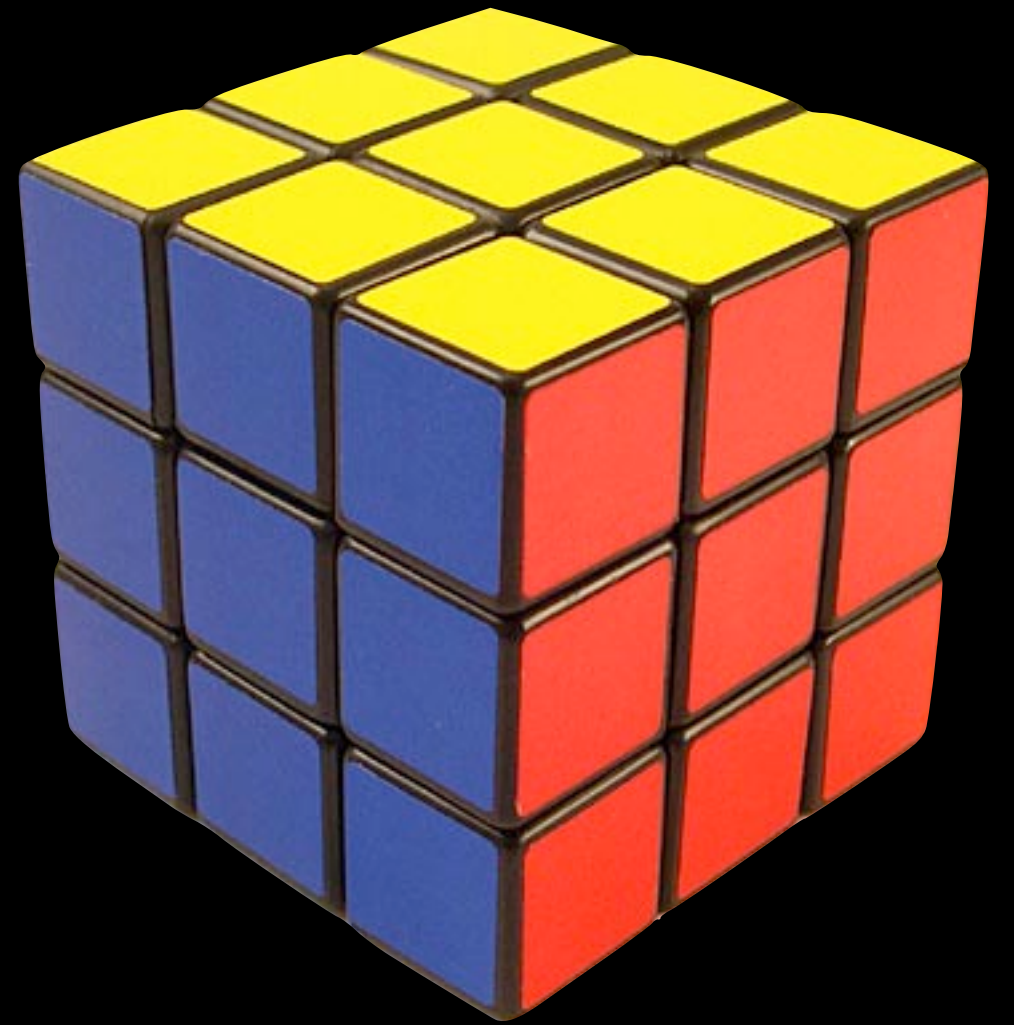
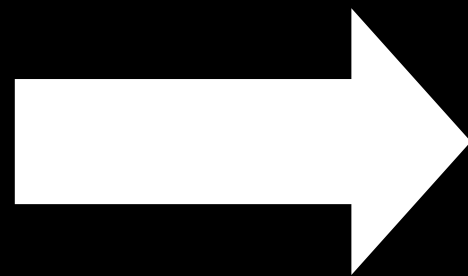
Varied level of difficulty

Unknown solution path

Known solution path







Amidonia Teen Wins \$20,000 Lottery Prize

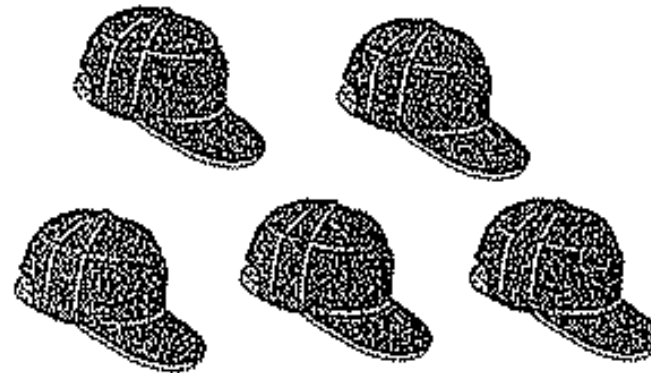
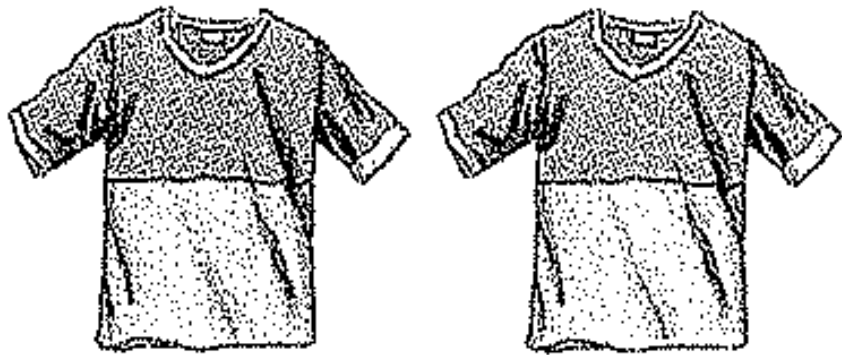
An Amidonia teenager has just won \$20,000 from a PowerPrism lottery ticket that she got as a birthday gift from her uncle. In a new lottery payoff scheme, the teen (whose name has been withheld) has two payoff choices: One option is to receive \$1,000 payments each year for the next twenty years. In the other plan the lottery will invest \$10,000 in a special savings account that will earn 8% interest, compounded annually, for 10 years. At the end of that time she can withdraw the balance of the account.

Estimate the damage index at 24°F.

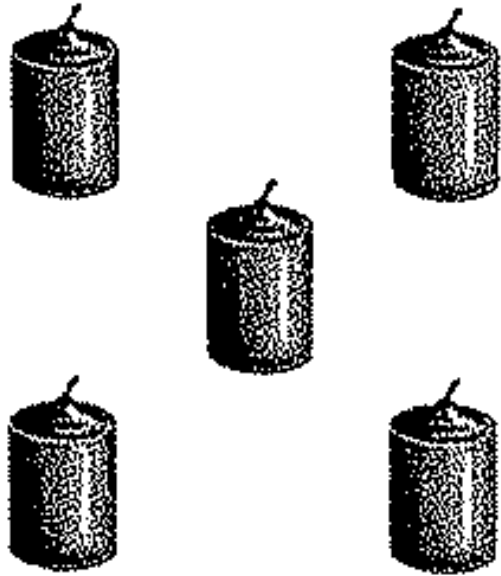
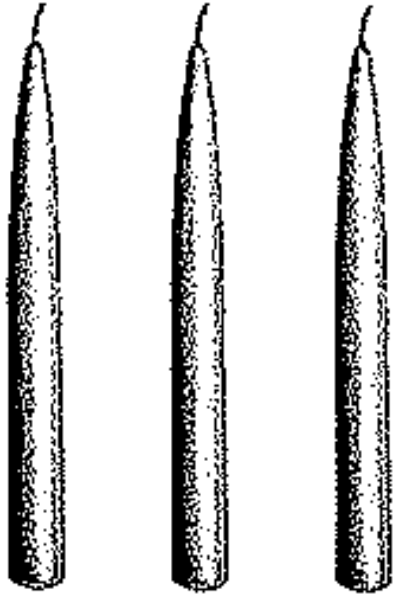
Temperature °F	Damage index
53°	11
57°	4
58°	4
63°	2
66°	0
67°	0
67°	0
67°	0
68°	0
69°	0
70°	4
70°	0
70°	4
70°	0
72°	0
73°	0
75°	0
75°	4
76°	0
76°	0
78°	0
79°	0
80°	?
81°	0



◦ \$ 96



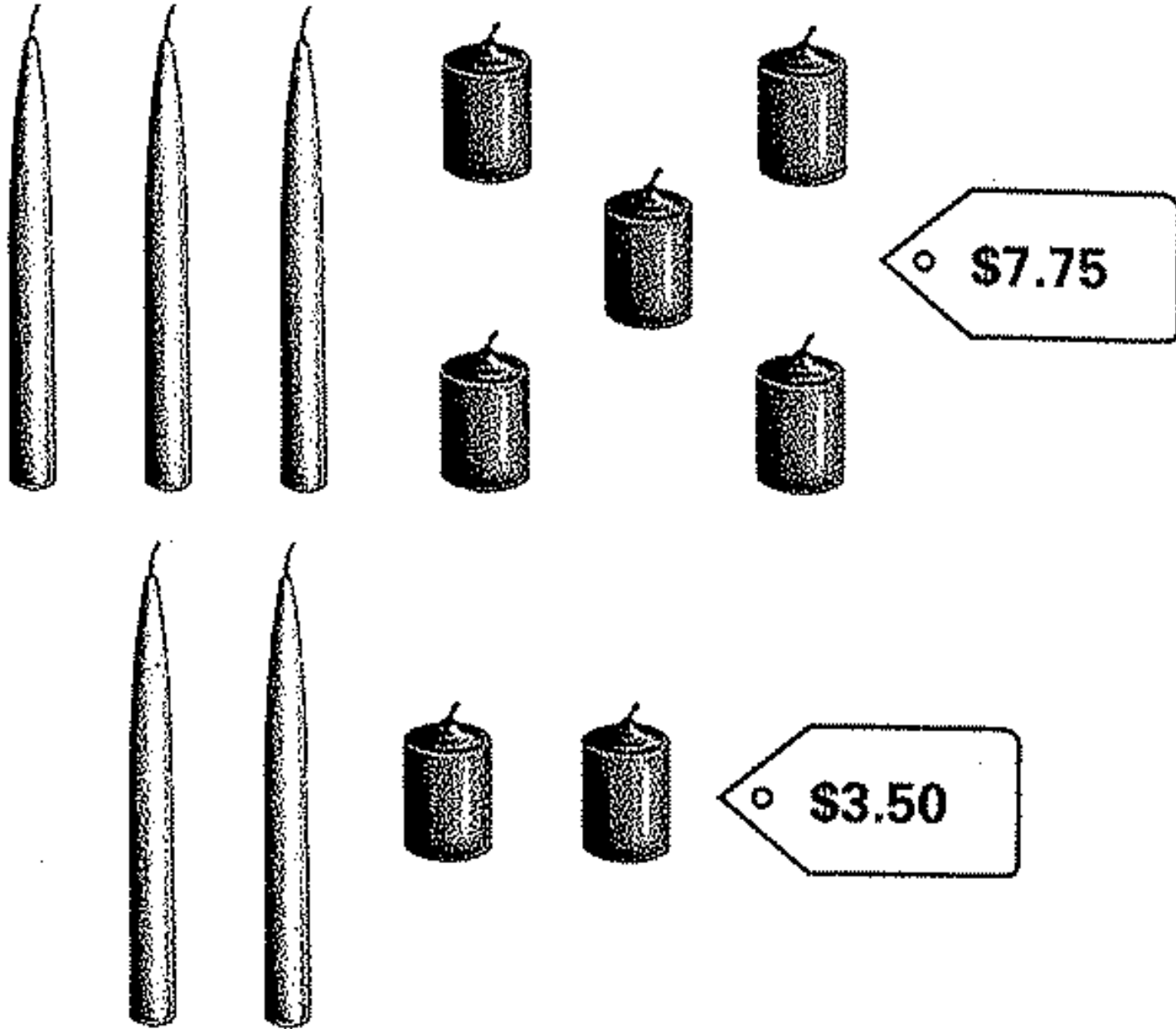
◦ \$ 99



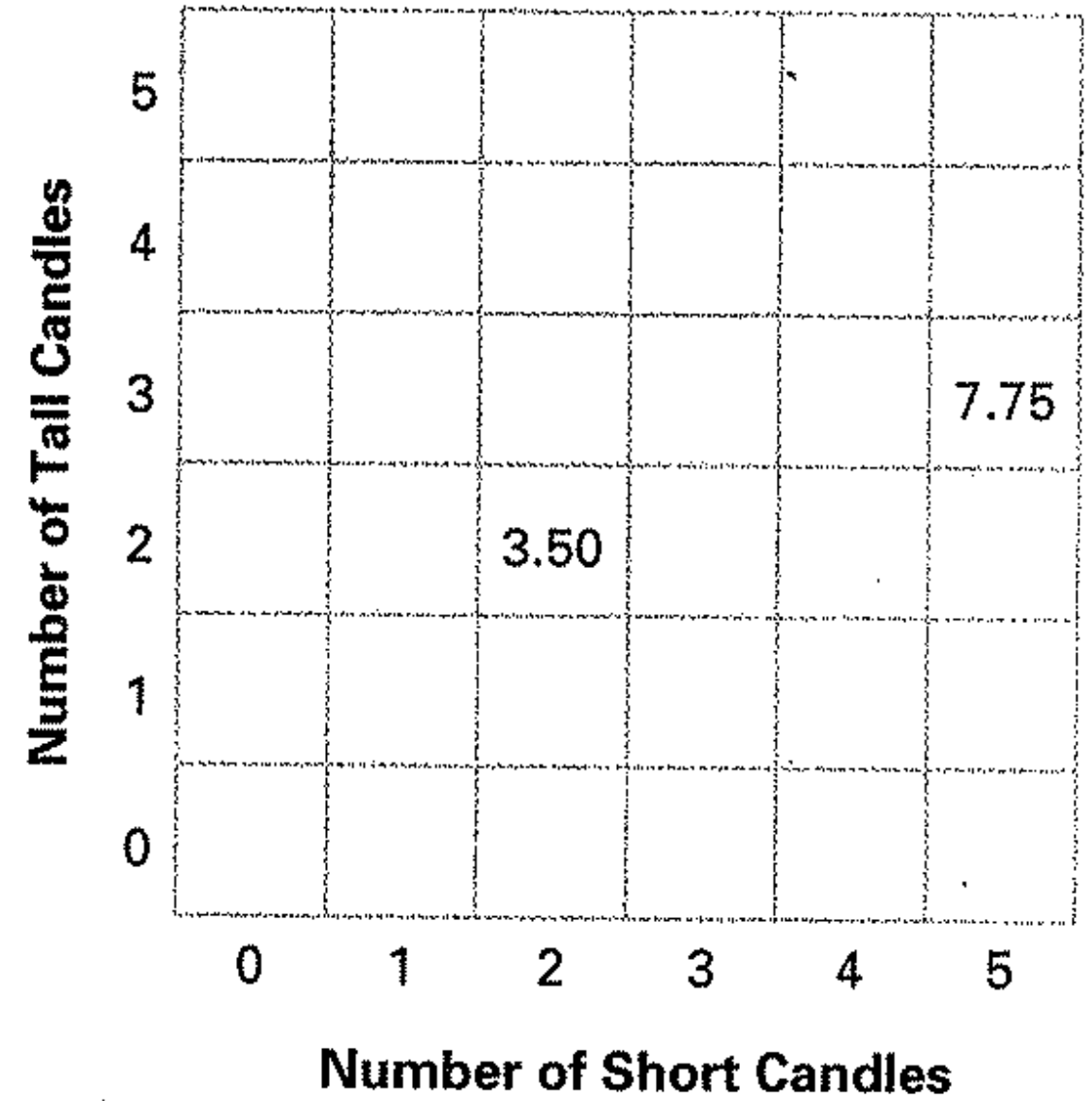
◦ \$7.75

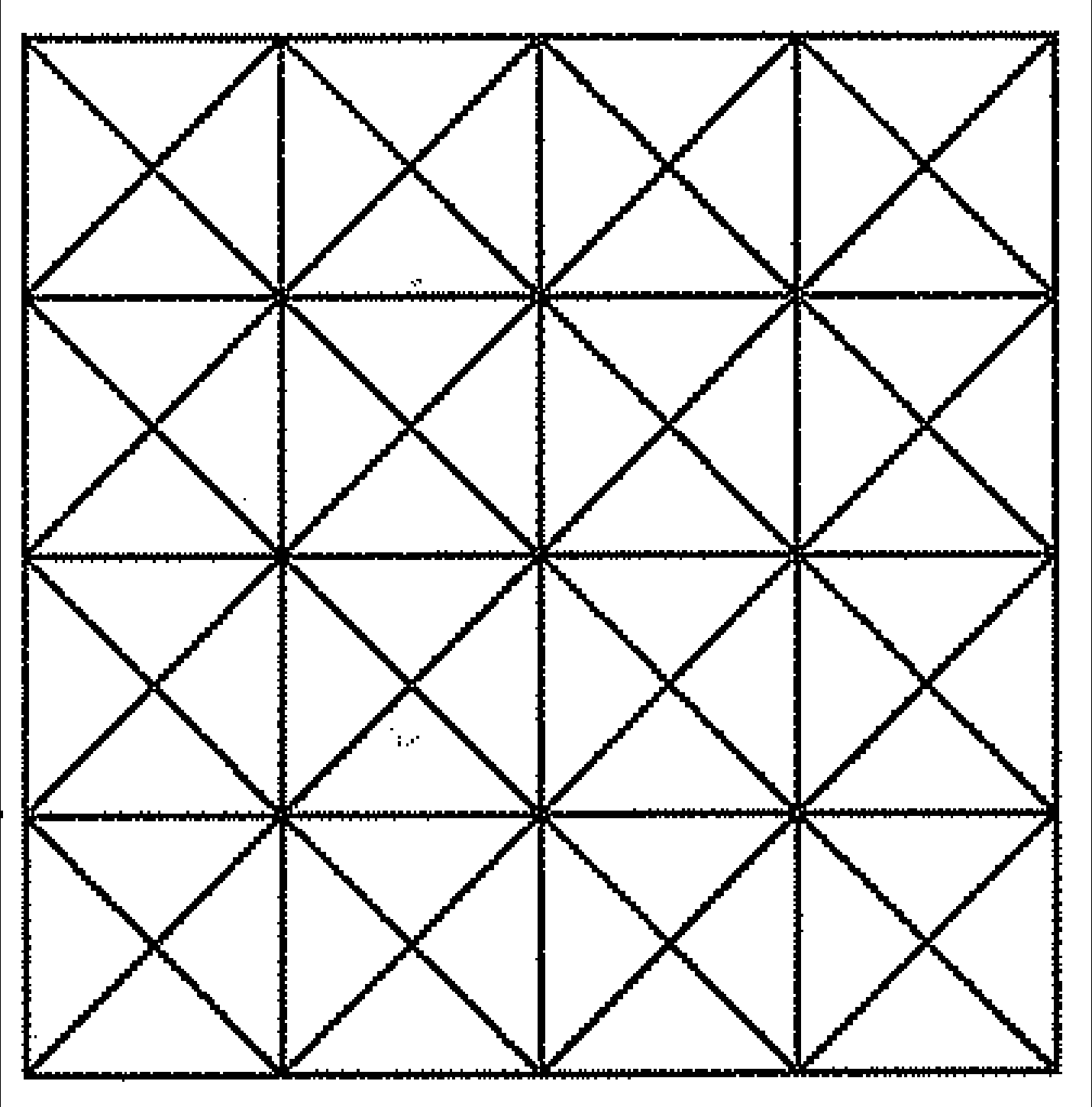


◦ \$3.50



Prices of Combinations (in dollars)





Data From 100 Bags of Plain M&M's® Candies (pre-March 2004)

Bag	Green	Yellow	Orange	Blue	Brown	Red	Total
1	3	10	9	5	10	18	55
2	5	12	4	6	19	11	57
3	7	10	9	4	16	12	58
4	4	14	2	1	14	19	56
5	12	7	8	7	14	13	61
6	10	9	6	5	15	8	55
7	11	11	6	6	12	12	58
8	8	15	5	3	16	10	57
9	2	11	4	4	24	12	57
10	5	7	4	1	26	13	56
11	6	13	4	4	15	18	60
12	5	8	4	2	23	16	58
13	9	13	4	4	14	11	55
14	9	10	5	5	14	14	57
15	5	19	5	2	13	14	58
16	3	15	5	2	19	11	55
17	3	10	4	3	23	14	57
18	6	7	5	5	15	22	60
19	5	7	3	4	21	14	54
20	8	7	8	2	20	16	61
21	10	11	7	7	8	14	57
22	7	10	3	5	20	12	57
23	3	8	6	3	25	10	55
24	6	11	9	3	10	17	56
25	10	12	1	2	15	17	57
26	4	12	4	7	14	16	57
27	6	9	6	7	15	13	56
28	5	11	6	7	17	7	53
29	1	10	6	5	22	14	58
30	10	4	8	0	26	9	57
31	4	14	6	4	18	12	58
32	6	18	2	4	19	14	58
33	6	7	8	4	20	11	56
34	12	11	6	4	11	11	55
35	5	10	6	2	12	16	51
36	8	9	4	4	16	17	58
37	2	12	2	6	11	21	54
38	5	7	3	4	21	19	59
39	8	7	8	2	20	16	61
40	10	11	7	7	8	14	57
41	7	10	3	5	20	12	57
42	3	8	6	3	23	10	50
43	6	11	9	3	10	17	56
44	10	12	1	2	15	17	57
45	5	13	2	4	22	11	57
46	6	10	9	5	14	13	57
47	6	16	7	3	16	9	57
48	6	10	4	5	23	10	58
49	10	7	2	6	19	9	53
50	4	12	8	6	10	15	55

Bag	Green	Yellow	Orange	Blue	Brown	Red	Total
51	9	9	6	6	17	10	57
52	4	13	4	6	17	13	57
53	6	12	3	8	13	12	54
54	11	8	8	12	9	8	56
55	1	16	7	3	22	10	59
56	6	11	6	4	19	11	57
57	7	7	7	3	10	21	55
58	7	2	8	10	15	13	55
59	6	10	6	7	12	15	56
60	6	16	7	3	16	9	57
61	6	10	4	5	23	10	58
62	10	7	2	6	19	9	53
63	4	12	8	6	10	15	55
64	9	12	8	6	8	15	58
65	10	6	5	4	12	16	53
66	4	11	3	2	21	15	56
67	6	15	4	8	10	10	53
68	6	8	7	1	19	14	55
69	6	8	8	6	10	16	54
70	9	11	7	4	15	10	56
71	6	9	8	2	19	14	58
72	3	10	9	5	10	18	55
73	5	12	4	6	19	11	57
74	7	10	9	4	16	12	58
75	4	14	2	1	16	19	56
76	1	8	10	1	22	14	56
77	5	15	4	9	11	11	57
78	3	11	6	3	24	10	57
79	10	9	4	1	23	10	57
80	5	10	7	1	21	13	57
81	6	14	7	7	14	5	53
82	9	11	2	6	13	16	57
83	7	7	9	0	13	20	56
84	8	10	4	5	13	10	50
85	4	11	2	1	24	15	57
86	4	12	6	3	21	12	58
87	5	8	7	4	20	13	57
88	7	11	7	7	13	10	55
89	9	11	4	2	12	18	56
90	4	15	8	4	16	10	57
91	7	11	6	4	18	11	58
92	5	8	8	3	20	12	56
93	7	3	2	6	26	11	55
94	9	6	3	1	28	12	59
95	12	11	9	2	18	5	58
96	9	11	3	3	17	12	55
97	5	12	6	5	17	13	58
98	4	11	9	3	21	10	58
99	11	12	5	3	17	9	57
100	6	16	6	6	16	4	54

20

Match each equation with the correct graph. All graphs are drawn using the same scales on the axes. Be prepared to explain how you can do this without using your calculator.

a. $y = -x^2 + 4$

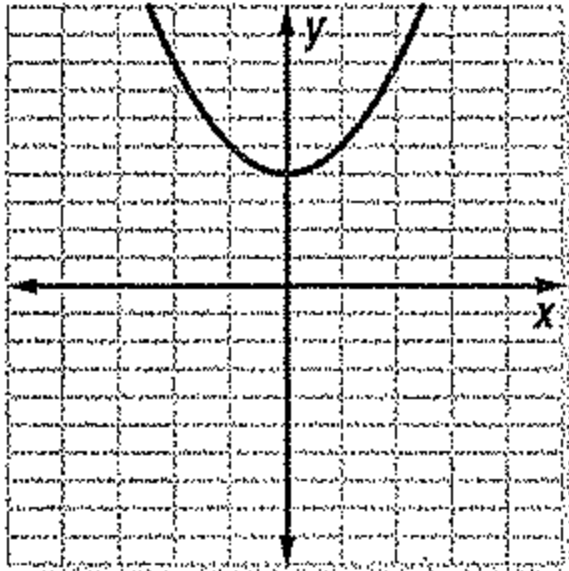
b. $y = -x^2 + 4x$

c. $y = -x^2 + 4x - 4$

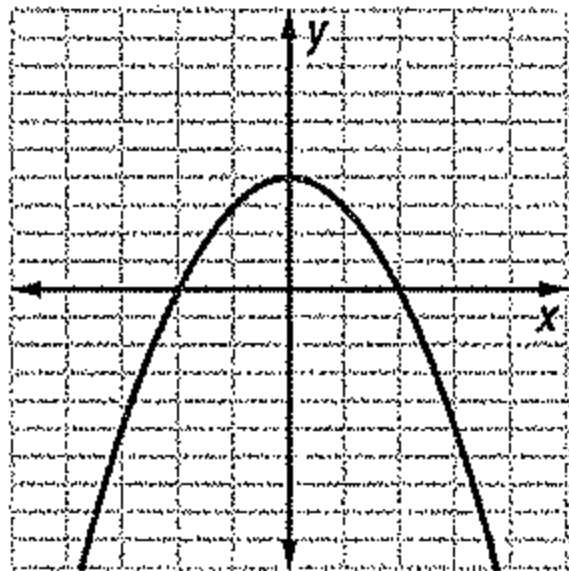
d. $y = x^2 + 4$

e. $y = -x^2 - 4x$

I



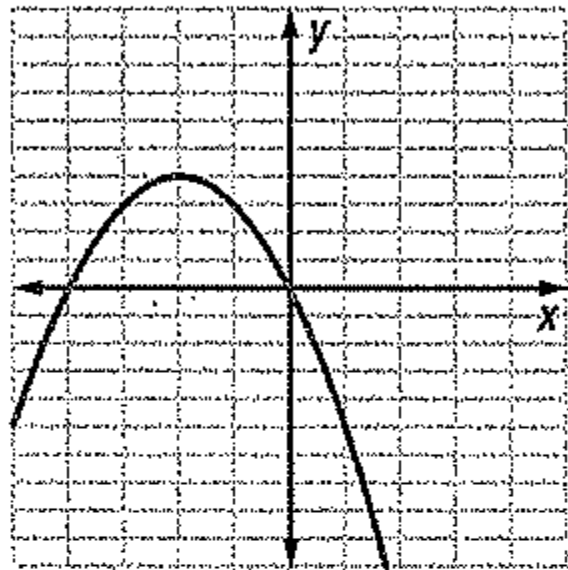
II



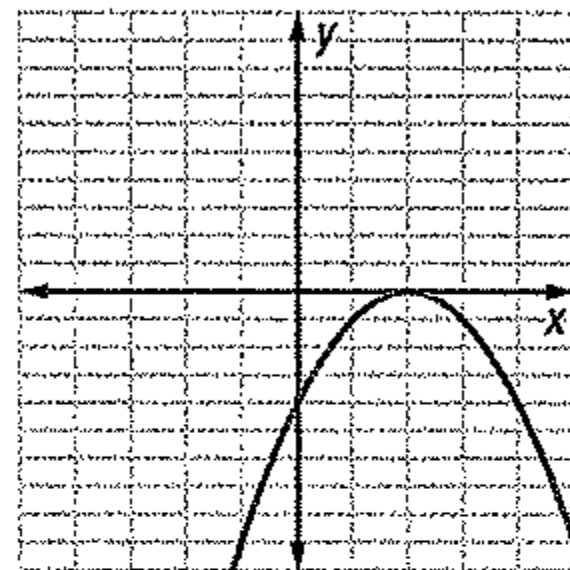
III



IV



V



Use the digits 1, 2, 3, and 4 exactly once to create as many expressions as you can that equal each of the integers from -20 to 20.

Use the digits 1, 2, 3, and 4 exactly once to create as many expressions as you can that equal each of the integers from -20 to 20. In the expressions you may:

Use the digits 1, 2, 3, and 4 exactly once to create as many expressions as you can that equal each of the integers from -20 to 20. In the expressions you may:

use addition, subtraction, multiplication, and division

Use the digits 1, 2, 3, and 4 exactly once to create as many expressions as you can that equal each of the integers from -20 to 20. In the expressions you may:

use addition, subtraction, multiplication, and division

use exponents

Use the digits 1, 2, 3, and 4 exactly once to create as many expressions as you can that equal each of the integers from -20 to 20. In the expressions you may:

use addition, subtraction, multiplication, and division

use exponents

use radicals and factorials

Use the digits 1, 2, 3, and 4 exactly once to create as many expressions as you can that equal each of the integers from -20 to 20. In the expressions you may:

use addition, subtraction, multiplication, and division

use exponents

use radicals and factorials

use parentheses and brackets

Use the digits 1, 2, 3, and 4 exactly once to create as many expressions as you can that equal each of the integers from -20 to 20. In the expressions you may:

use addition, subtraction, multiplication, and division

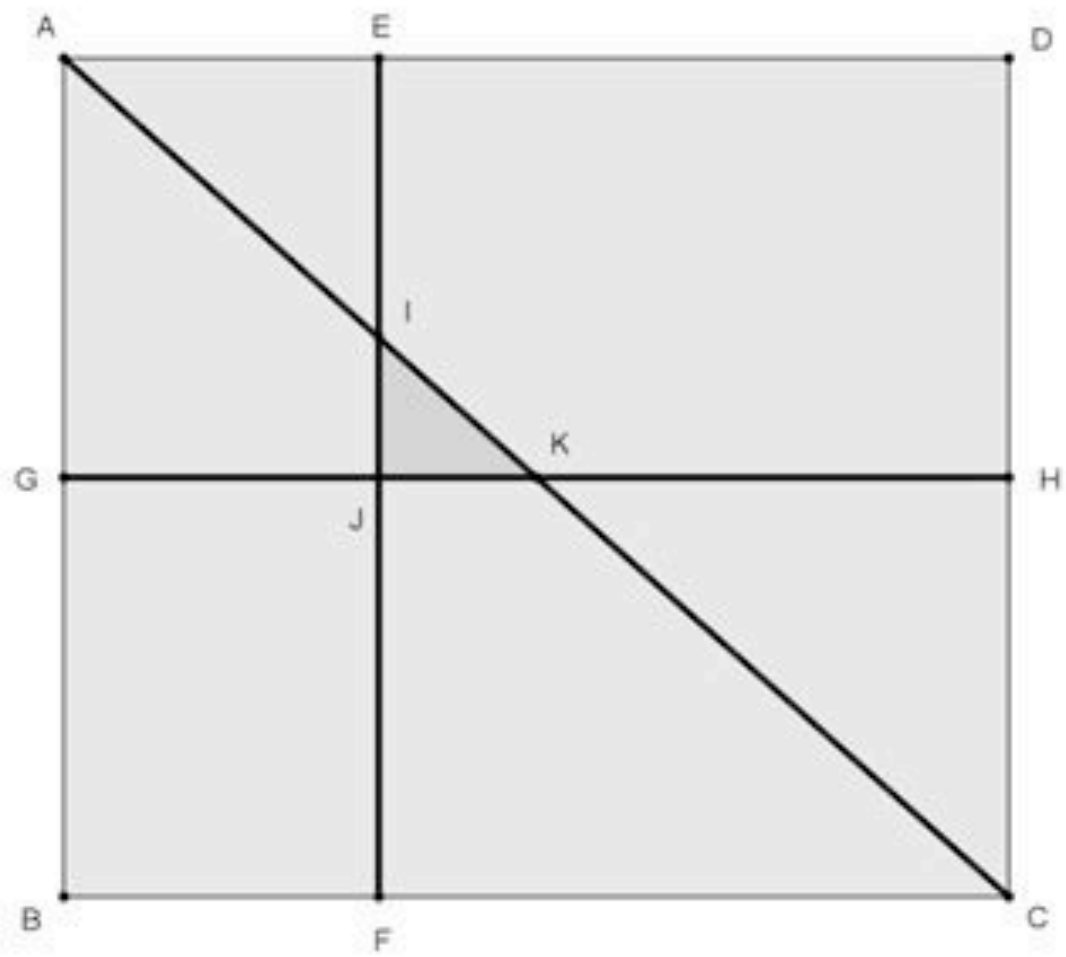
use exponents

use radicals and factorials

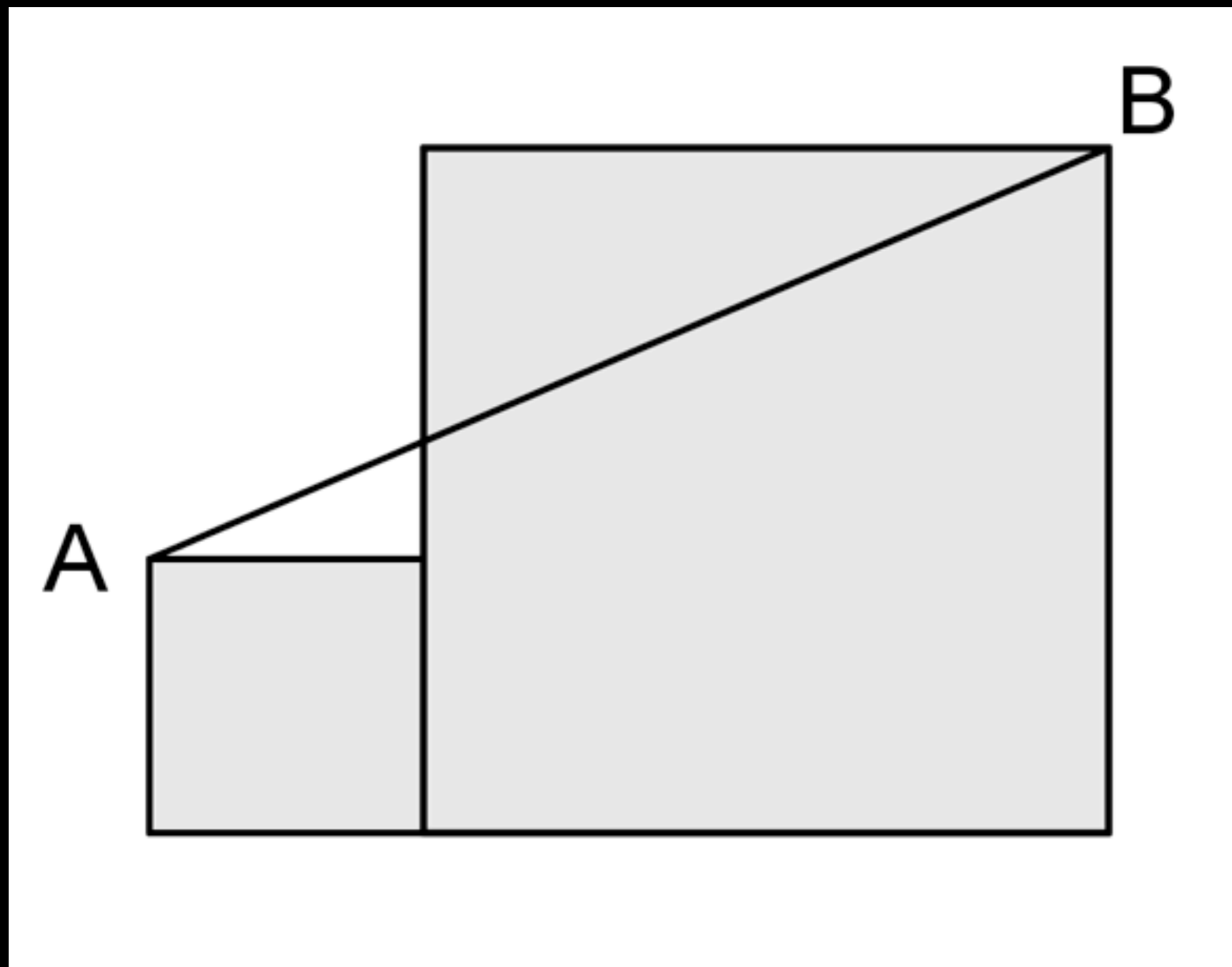
use parentheses and brackets

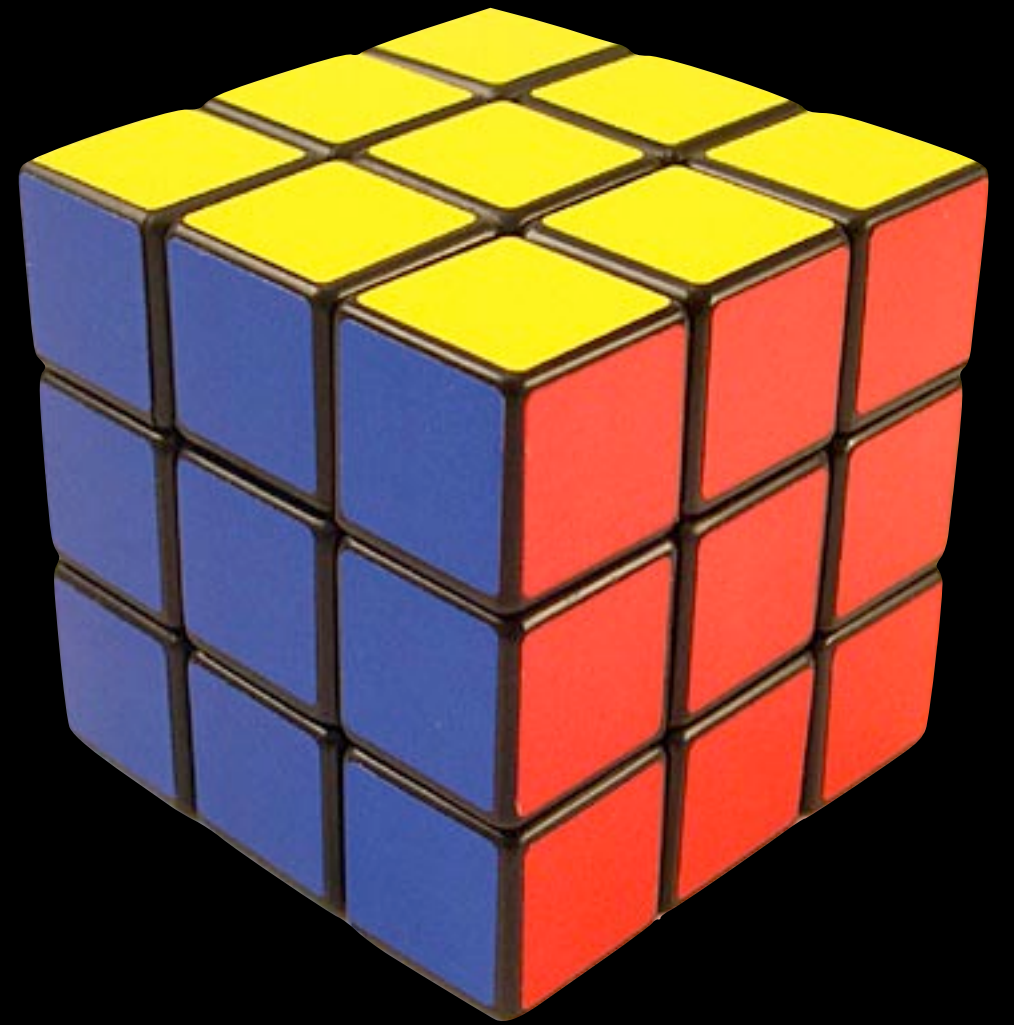
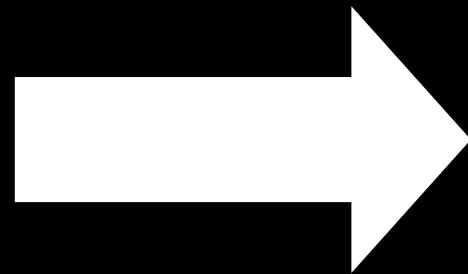
put a negative sign in front of a digit

16. In rectangle $ABCD$, lines EF and AB are parallel and lines GH and AD are parallel. Line AC is a diagonal. Find the area of $ABCD$ if the ratio $AG : GB = 1$, $DE : EA = 2$, and the area of triangle IJK is equal to 1 square unit.

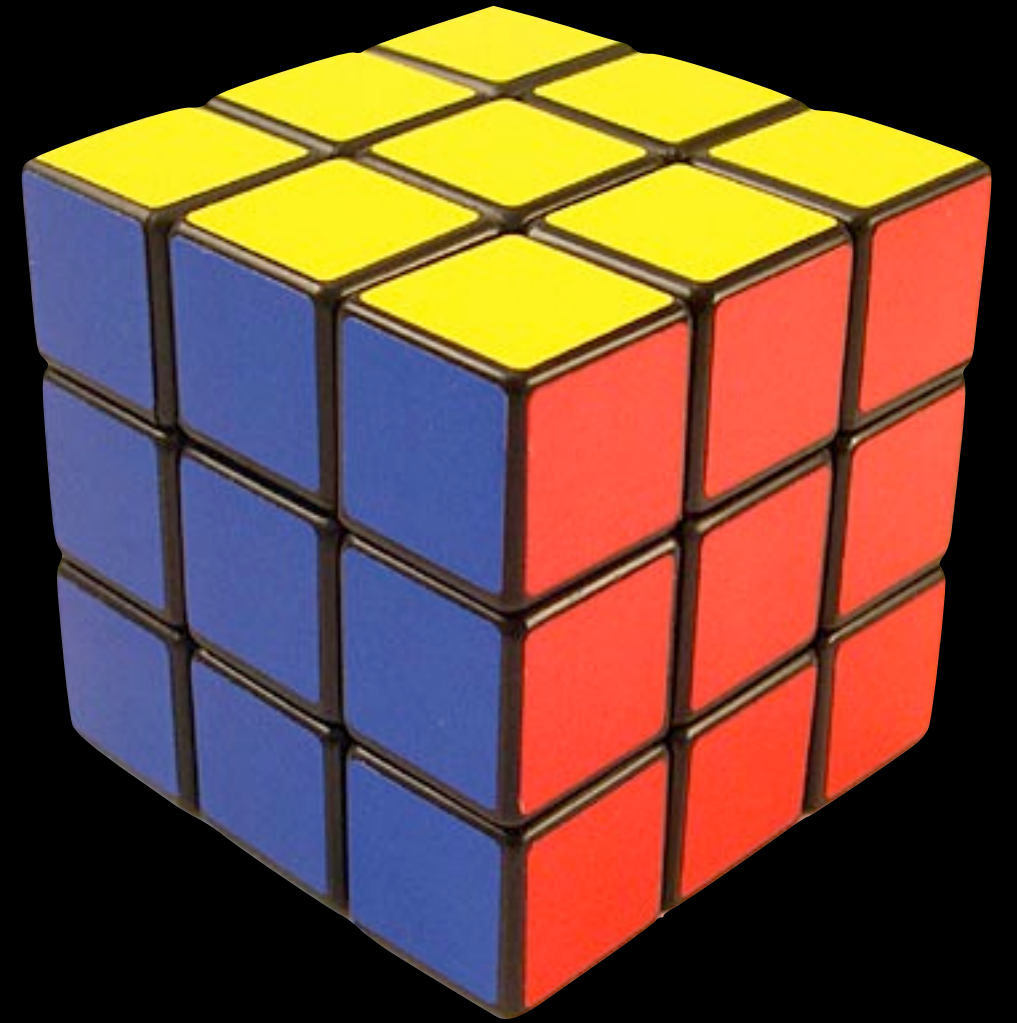
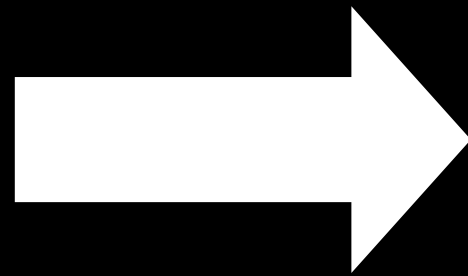


The smaller of the two squares in the figure below has a perimeter of 8 centimeters. The larger of the two squares has an area of 25 square centimeters. What is the distance from point A to point B?

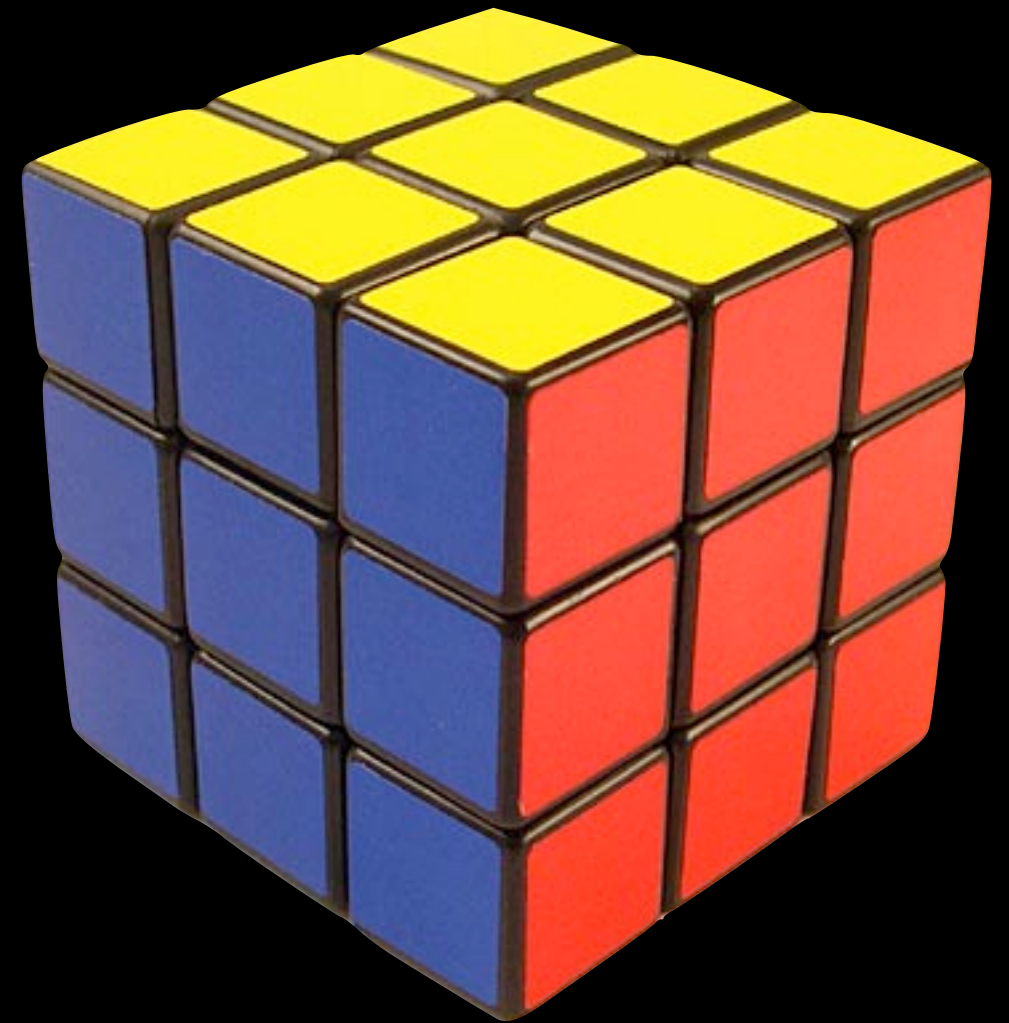
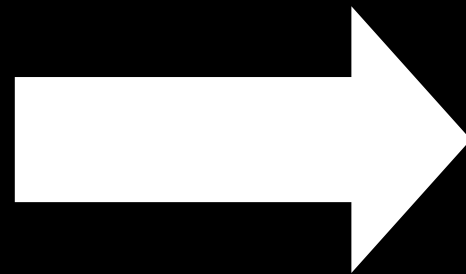




Got problems or exercises?



Got problems or exercises?



jcamidon@go.olemiss.edu
amidonplanet.com

