



The Draftsman's Cipher

Solve the algebraic system of equations using mechanical, graphite, and charcoal pencils to determine the four-digit passcode.

Name: _____ Date: _____

1 THE KEY

$$\begin{array}{l} \star = \square \quad \bullet = 25 \quad (?) = \square \quad [?] = \square \quad \heartsuit = 24 \\ \triangle = \square \end{array}$$

Every symbol is a whole number from 1 to 30. A number in front of a shape means multiply: 2 stars = 2 x star. A small 2 after a shape means square it: star² = star x star. sqrt(shape) is the square root of that shape's value.

2 FIND THE MISSING VALUES

Some shapes in the key are missing. Use these to work them out, in order, and write them into the key.

$$\blacksquare + 3\star = 102$$

$$\blacksquare - 3\star = -60$$

$$\bigcirc \times \blacksquare - \bullet = 206$$

$$\blacktriangle \times \blacksquare - \heartsuit = 60$$

3 CRACK THESE

$$1. (\bullet - \heartsuit) \times (\bullet + \heartsuit) = \square$$

$$2. (\star - \bigcirc) \times (\star + \bigcirc) = \square$$

CODE 1

$$3. \text{sqrt}(\bullet) \times \blacksquare = \square$$

$$4. 2\star^2 + \bullet = \square$$

CODE 2

$$5. \text{sqrt}(\bullet) + \bigcirc^2 = \square$$

$$6. \heartsuit^2 + \blacktriangle^2 = \square$$

CODE 3

$$7. 2\blacktriangle^2 + \blacksquare = \square$$

$$8. \bigcirc^3 - \bullet = \square$$

CODE 4

$$9. (\blacksquare + \blacktriangle)^2 = \square$$

$$10. \blacktriangle^2 + \blacksquare^2 = \square$$

4 THE VAULT CODE

Write the ONES digit of your answers to problems 2, 4, 6, 8 (the ones tagged CODE 1-4), in that order. That opens the vintage steel drafting.

Answer Key

The Draftsman's Cipher · Grade 8 Crack the Code

The key

★ star = 27 (hidden) ● circle = 25 ○ ring = 11 (hidden) ■ square = 21 (hidden) ♥ heart = 24
 ▲ triangle = 4 (hidden)

Every symbol is a whole number from 1 to 30.

1. $(● - ♥) \times (● + ♥)$ ((circle - heart) x (circle + heart)) 49
2. $(★ - ○) \times (★ + ○)$ ((star - ring) x (star + ring)) 608
3. $\text{sqrt}(●) \times ■$ (sqrt(circle) x square) 105
4. $2★^2 + ●$ (2 x star^2 + circle) 1483
5. $\text{sqrt}(●) + ○^2$ (sqrt(circle) + ring^2) 126
6. $♥^2 + ▲^2$ (heart^2 + triangle^2) 592
7. $2▲^2 + ■$ (2 x triangle^2 + square) 53
8. $○^3 - ●$ (ring^3 - circle) 1306
9. $(■ + ▲)^2$ ((square + triangle)^2) 625
10. $▲^2 + ■^2$ (triangle^2 + square^2) 457

Vault code: **8 3 2 6**