

# 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

$$\begin{array}{l} \star = \square \\ \bullet = 25 \\ \textcircled{?} = \square \\ \boxed{?} = \square \\ \heartsuit = 24 \\ \triangleup = \square \end{array}$$

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: star<sup>2</sup> = 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**