Crack the Vault Code

Someone locked the vault with a 4-digit code. Work out what each shape is worth and crack it.

Name: _____ **Date:** _____

1 THE KEY

✚ = ☐ ⚡ = ☐ ♥? = ☐ ⬢ = 4 ◆ = 26

? = ☐

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^2 = star x star. sqrt(shape) is the square root of that square'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.

$2♥ + ⚡ = 23$
$2♥ - 2⚡ = 2$

$✚ \times ♥ = 240$

$2■ + ⬢ = 38$

3 CRACK THESE

1. $\text{sqrt}(⬢) + ◆^2 =$ ☐
2. $♥^2 - ✚ =$ ☐ CODE 1
3. $(✚ + ♥)^2 =$ ☐
4. $3✚ - 2♥ + ■ =$ ☐ CODE 2
5. $■^2 + ⬢^2 =$ ☐
6. $⚡^2 - ✚ =$ ☐ CODE 3
7. $\text{sqrt}(⬢) + ✚ =$ ☐
8. $(■ + ⚡)^2 =$ ☐ CODE 4
9. $⚡^2 + ♥^2 =$ ☐
10. $◆ \times ⚡ - ♥^2 =$ ☐

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 vault.

TEACHER / PARENT

Answer Key

Crack the Vault Code · Grade 8 Crack the Code

The key

✚ cross = **30** (hidden) ⚡ lightning bolt = **7** (hidden) ♥ heart = **8** (hidden) ⬢ hexagon = **4**

◆ diamond = **26** ■ square = **17** (hidden)

Every symbol is a whole number from 1 to 30.

1. **sqrt(⬢) + ◆²** (sqrt(hexagon) + diamond^2) — **678**
2. **♥² - ✚** (heart^2 - cross) — **34**
3. **(✚ + ♥)²** ((cross + heart)^2) — **1444**
4. **3✚ - 2♥ + ■** (3 x cross - 2 x heart + square) — **91**
5. **■² + ⬢²** (square^2 + hexagon^2) — **305**
6. **⚡² - ✚** (lightning bolt^2 - cross) — **19**
7. **sqrt(⬢) + ✚** (sqrt(hexagon) + cross) — **32**
8. **(■ + ⚡)²** ((square + lightning bolt)^2) — **576**
9. **⚡² + ♥²** (lightning bolt^2 + heart^2) — **113**
10. **◆ × ⚡ - ♥²** (diamond x lightning bolt - heart^2) — **118**

Vault code: 4 1 9 6