



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

$$\begin{array}{l} \diamondsuit = \square \quad \smile = \square \quad \bigcirc = 4 \quad \heartsuit = \square \quad \star = \square \\ \text{⚡} = 18 \end{array}$$

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.

$$2\smile + 3\star = 65$$

$$2\smile - \star = 21$$

$$2\diamondsuit + \smile = 50$$

$$2\heartsuit + \star = 39$$

3 CRACK THESE

$$1. \sqrt{\smile} + \star^2 = \square$$

$$2. 2\smile^2 + \bigcirc = \square$$

CODE 1

$$3. 2\star^2 + \text{⚡} = \square$$

$$4. \sqrt{\smile} + \star = \square$$

CODE 2

$$5. \diamondsuit^3 - \heartsuit = \square$$

$$6. \smile^2 + \bigcirc^2 = \square$$

CODE 3

$$7. \star^2 - \smile = \square$$

$$8. \text{⚡}^3 - \diamondsuit = \square$$

CODE 4

$$9. (\star - \bigcirc) \times (\star + \bigcirc) = \square$$

$$10. (\heartsuit + \diamondsuit)^2 = \square$$

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 vault.

Answer Key

Crack the Vault Code · Grade 8 Crack the Code

The key

 diamond = **17** (hidden)
  moon = **16** (hidden)
  ring = **4**
  hexagon = **14** (hidden)
 star = **11** (hidden)
 lightning bolt = **18**

Every symbol is a whole number from 1 to 30.

1. $\sqrt{\text{moon}} + \text{star}^2$ (sqrt(moon) + star^2) **125**
2. $2\text{moon}^2 + \text{ring}$ (2 x moon^2 + ring) **516**
3. $2\text{star}^2 + \text{lightning bolt}$ (2 x star^2 + lightning bolt) **260**
4. $\sqrt{\text{moon}} + \text{star}$ (sqrt(moon) + star) **15**
5. $\text{diamond}^3 - \text{hexagon}$ (diamond^3 - hexagon) **4899**
6. $\text{moon}^2 + \text{ring}^2$ (moon^2 + ring^2) **272**
7. $\text{star}^2 - \text{moon}$ (star^2 - moon) **105**
8. $\text{lightning bolt}^3 - \text{diamond}$ (lightning bolt^3 - diamond) **5815**
9. $(\text{star} - \text{ring}) \times (\text{star} + \text{ring})$ ((star - ring) x (star + ring)) **105**
10. $(\text{hexagon} + \text{diamond})^2$ ((hexagon + diamond)^2) **961**

Vault code: **6 5 2 5**