



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

$$\bigcirc = 13 \quad \triangle = \square \quad \heartsuit = \square \quad \text{⚡} = \square \quad \blacklozenge = 6$$
$$\text{⬢} = \square$$

Every symbol is a whole number from 1 to 20. 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.

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.

$$\heartsuit \times \blacklozenge = 12$$

$$\blacktriangle \times \bigcirc = 65$$

$$\text{⬢} \times \blacktriangle = 55$$

$$2 \text{⚡} + \text{⬢} = 43$$

3 CRACK THESE

$$1. (\blacklozenge + \text{⬢})^2 = \square$$

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

CODE 1

$$3. 3\heartsuit - 2\blacklozenge + \text{⚡} = \square$$

$$4. \bigcirc^2 + \heartsuit^2 = \square$$

CODE 2

$$5. 2 \times (\bigcirc + \heartsuit) - \blacktriangle = \square$$

$$6. 2 \times (\blacklozenge + \bigcirc) - \blacktriangle = \square$$

CODE 3

$$7. 3\blacklozenge - 2\text{⬢} + \bigcirc = \square$$

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

CODE 4

$$9. (\text{⬢} - \heartsuit) \times (\text{⬢} + \heartsuit) = \square$$

$$10. \bigcirc^2 + \blacklozenge = \square$$

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 6 Crack the Code

The key

 ring = **13**
  triangle = **5** (hidden)
  heart = **2** (hidden)
  lightning bolt = **16** (hidden)
 pentagon = **6**
 hexagon = **11** (hidden)

Every symbol is a whole number from 1 to 20.

- | | | |
|-----|--|-------------|
| 1. | $(\text{pentagon} + \text{hexagon})^2$ ((pentagon + hexagon)^2) | 289 |
| 2. | $(\text{ring} - \text{triangle}) \times (\text{ring} + \text{triangle})$ | 144 |
| 3. | $3 \times \text{heart} - 2 \times \text{pentagon} + \text{lightning bolt}$ (3 x heart - 2 x pentagon + lightning bolt) | 10 |
| 4. | $\text{ring}^2 + \text{heart}^2$ (ring^2 + heart^2) | 173 |
| 5. | $2 \times (\text{ring} + \text{heart}) - \text{triangle}$ (2 x (ring + heart) - triangle) | 25 |
| 6. | $2 \times (\text{pentagon} + \text{ring}) - \text{triangle}$ (2 x (pentagon + ring) - triangle) | 33 |
| 7. | $3 \times \text{pentagon} - 2 \times \text{hexagon} + \text{ring}$ (3 x pentagon - 2 x hexagon + ring) | 9 |
| 8. | ring^3 (ring^3) | 2197 |
| 9. | $(\text{hexagon} - \text{heart}) \times (\text{hexagon} + \text{heart})$ ((hexagon - heart) x (hexagon + heart)) | 117 |
| 10. | $\text{ring}^2 + \text{pentagon}$ (ring^2 + pentagon) | 175 |

Vault code: **4 3 3 7**