



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

$$\text{?} = \square \quad \text{?} = \square \quad \text{☾} = -9 \quad \blacklozenge = -6 \quad \star = -7 \quad \oplus = \square$$

Every symbol is a whole number from -9 to 20 (some are negative!). 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.

$$2\bigcirc + \text{☾} = 11$$

$$\text{☾} - \heartsuit = -26$$

$$\heartsuit - \oplus = 12$$

3 CRACK THESE

$$1. \bigcirc \times \blacklozenge - \oplus = \square$$

$$2. \blacklozenge^2 + \star = \square$$

CODE 1

$$3. \heartsuit \times \oplus - \text{☾} = \square$$

$$4. \oplus \times \blacklozenge = \square$$

CODE 2

$$5. 3\star - 2\bigcirc + \oplus = \square$$

$$6. \bigcirc - \text{☾} - \blacklozenge = \square$$

CODE 3

$$7. \text{☾}^2 + \bigcirc = \square$$

$$8. \text{☾} + \bigcirc = \square$$

CODE 4

$$9. \blacklozenge \times (\heartsuit - \text{☾}) = \square$$

$$10. \text{☾} \times \bigcirc = \square$$

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 7 Crack the Code

The key

 ring = **10** (hidden)
  heart = **17** (hidden)
  moon = **-9**
  diamond = **-6**
  star = **-7**
 cross = **5** (hidden)

Every symbol is a whole number from -9 to 20 (some are negative!).

- | | | |
|-----|--|-------------|
| 1. | $\bigcirc \times \blacklozenge - \oplus$ (ring x diamond - cross) | -65 |
| 2. | $\blacklozenge^2 + \star$ (diamond ² + star) | 29 |
| 3. | $\heartsuit \times \oplus - \lrcorner$ (heart x cross - moon) | 94 |
| 4. | $\oplus \times \blacklozenge$ (cross x diamond) | -30 |
| 5. | $3\star - 2\bigcirc + \oplus$ (3 x star - 2 x ring + cross) | -36 |
| 6. | $\bigcirc - \lrcorner - \blacklozenge$ (ring - moon - diamond) | 25 |
| 7. | $\lrcorner^2 + \bigcirc$ (moon ² + ring) | 91 |
| 8. | $\lrcorner + \bigcirc$ (moon + ring) | 1 |
| 9. | $\blacklozenge \times (\heartsuit - \lrcorner)$ (diamond x (heart - moon)) | -156 |
| 10. | $\lrcorner \times \bigcirc$ (moon x ring) | -90 |

Vault code: 9 0 5 1