

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

$$\text{?} = \square \quad \text{?} = \square \quad \text{?} = -9 \quad \text{?} = -6 \quad \text{?} = -7 \quad \text{?} = \square$$

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.

$$2\text{O} + \text{?} = 11$$

$$\text{?} - \text{?} = -26$$

$$\text{?} - \text{?} = 12$$

3 CRACK THESE

$$1. \text{O} \times \text{?} - \text{?} = \square$$

$$2. \text{?}^2 + \text{?} = \square$$

CODE 1

$$3. \text{?} \times \text{?} - \text{?} = \square$$

$$4. \text{?} \times \text{?} = \square$$

CODE 2

$$5. 3\text{?} - 2\text{O} + \text{?} = \square$$

$$6. \text{O} - \text{?} - \text{?} = \square$$

CODE 3

$$7. \text{?}^2 + \text{O} = \square$$

$$8. \text{?} + \text{O} = \square$$

CODE 4

$$9. \text{?} \times (\text{?} - \text{?}) = \square$$

$$10. \text{?} \times \text{O} = \square$$

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

Vault code: **9 0 5 1**