



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

$$\heartsuit = \square \quad \spadesuit = \square \quad \lightningbolt = 10 \quad \triangle = \square \quad \frown = -7 \quad \bullet = 7$$

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.

$$\heartsuit + 5 = 2$$

$$\spadesuit - \lightningbolt = -2$$

$$2\blacktriangle + \spadesuit = -8$$

3 CRACK THESE

$$1. \bullet \times \frown = \square$$

$$2. \blacktriangle^2 - \lightningbolt = \square$$

CODE 1

$$3. \lightningbolt \times (\bullet - \heartsuit) = \square$$

$$4. \bullet \times \spadesuit - \frown = \square$$

CODE 2

$$5. (\heartsuit + \blacktriangle) \times \spadesuit = \square$$

$$6. \spadesuit^2 - \bullet = \square$$

CODE 3

$$7. \heartsuit^2 + \lightningbolt = \square$$

$$8. (\heartsuit + \bullet) \times \lightningbolt = \square$$

CODE 4

$$9. \lightningbolt - \heartsuit - \frown = \square$$

$$10. \blacktriangle \times \lightningbolt - \frown = \square$$

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

 heart = **-3** (hidden)
  diamond = **8** (hidden)
  lightning bolt = **10**
  triangle = **-8** (hidden)
 moon = **-7**
 circle = **7**

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

- | | | |
|-----|---|------------|
| 1. |  x  (circle x moon) | -49 |
| 2. |  ² -  (triangle^2 - lightning bolt) | 54 |
| 3. |  x ( - ) (lightning bolt x (circle - heart)) | 100 |
| 4. |  x  -  (circle x diamond - moon) | 63 |
| 5. | ( + ) x  ((heart + triangle) x diamond) | -88 |
| 6. |  ² -  (diamond^2 - circle) | 57 |
| 7. |  ² +  (heart^2 + lightning bolt) | 19 |
| 8. | ( + ) x  ((heart + circle) x lightning bolt) | 40 |
| 9. |  -  -  (lightning bolt - heart - moon) | 20 |
| 10. |  x  -  (triangle x lightning bolt - moon) | -73 |

Vault code: **4 3 7 0**