



# 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

$$\begin{array}{l} \triangle = \square \quad \hexagon = \square \quad \diamond = \square \quad + = 16 \quad \pentagon = \square \\ \circ = \square \end{array}$$

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: star<sup>2</sup> = 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.

$$\begin{array}{l} \hexagon \times \triangle = 24 \\ \hexagon - \triangle = 5 \end{array}$$

$$\begin{array}{l} 2\pentagon + 2\diamond = 38 \\ \pentagon - \diamond = -11 \end{array}$$

$$\circ^2 = 289$$

## 3 CRACK THESE

1.  $+^2 + \hexagon^2 + \pentagon^2 = \square$

2.  $(2+ - \pentagon)^2 = \square$  CODE 1

3.  $(+^2 - \hexagon^2) \div (+ - \hexagon) = \square$

4.  $(+^2 - \triangle^2) \div (+ - \triangle) = \square$  CODE 2

5.  $\pentagon^3 - \hexagon^2 = \square$

6.  $(\pentagon + \triangle)^2 - (\pentagon - \triangle)^2 = \square$  CODE 3

7.  $\text{sqrt}(\triangle^2 + \pentagon^2) = \square$

8.  $(+ + \diamond)^2 - (+ - \diamond)^2 = \square$  CODE 4

9.  $\circ^3 - \hexagon^2 = \square$

10.  $\text{sqrt}(+) + \hexagon^2 = \square$

## 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 10 Crack the Code

## The key

 triangle = **3** (hidden)    
  hexagon = **8** (hidden)    
  diamond = **15** (hidden)    
  cross = **16**  
 pentagon = **4** (hidden)    
  ring = **17** (hidden)

Every symbol is a whole number from 1 to 30.

1.  $\text{cross}^2 + \text{hexagon}^2 + \text{pentagon}^2$  **336**
2.  $(2 \times \text{cross} - \text{pentagon})^2$  **784**
3.  $(\text{cross}^2 - \text{hexagon}^2) \div (\text{cross} - \text{hexagon})$  **24**
4.  $(\text{cross}^2 - \text{triangle}^2) \div (\text{cross} - \text{triangle})$  **19**
5.  $\text{pentagon}^3 - \text{hexagon}^2$  **0**
6.  $(\text{pentagon} + \text{triangle})^2 - (\text{pentagon} - \text{triangle})^2$  **48**
7.  $\text{sqrt}(\text{triangle}^2 + \text{pentagon}^2)$  **5**
8.  $(\text{cross} + \text{diamond})^2 - (\text{cross} - \text{diamond})^2$  **960**
9.  $\text{ring}^3 - \text{hexagon}^2$  **4849**
10.  $\text{sqrt}(\text{cross}) + \text{hexagon}^2$  **68**

Vault code: **4980**