

Many numbers can be expressed as the difference of two perfect squares.

For example,

$$20 = 6^2 - 4^2$$

$$21 = 5^2 - 2^2$$

$$36 = 6^2 - 0^2$$

How many of the numbers from **1** to **30** can you express as the difference of two perfect squares?

Here are some questions to consider:

What do you notice about the difference between square of consecutive numbers?

What about the difference when I square two numbers which differ by **2**?
By **3**? By **4**? ...

When is the difference between two square numbers odd?
And when is it even?

What do you notice about the numbers you **cannot** express as the difference of two perfect squares?

Can you prove any of your findings?