

Two numbers differ by 6. If the numbers are squared and then added, the result is 146. What are the numbers?

Let  $x$  represent the first number

Let  $x+6$  represent the 2nd number.

$$x^2 + (x+6)^2 = 146$$

$$x^2 + x^2 + 12x + 36 = 146$$

$$2x^2 + 12x + 36 - 146 = 0$$

$$2x^2 + 12x - 110 = 0$$

$$2(x^2 + 6x - 55) = 0$$

$$2(x+11)(x-5) = 0$$

$$x+11=0 \quad \text{or} \quad x-5=0$$

$$x=-11 \quad \text{or} \quad x=5$$

$$x+6=-5 \quad \text{or} \quad x+6=11$$

Answer: -11, -5 and 5, 11