Here's what's even more important:

- If you make one of the charges *x* times bigger, because the q is in the numerator, the force will also become *x* times stronger.
- If you separate the charges by a distance that's *x* times bigger, because the r is in the denominator and because **it's squared,** the force will become $1/x^2$ of the original. So it will get a lot weaker.

Example2 What happens to the force between two charges if their separation distance doubles?

Answer: It becomes only $1/x^2$ of the original = $1/2^2$ = ¼ = 0.25 times as big.

Example2 What happens to the force between two charges if one of the charges becomes 3 times as big?

Answer:

It becomes x times as big, so 3 times as big.

Example 3 What happens if both charges become twice as big and the separation distance is 1/3 of the original?

Answer:

The effect of the charges on forces is a factor of 2*2 = 4

The effect of the distance on forces is a factor of $1/x^2 = 1/(1/3)^2 = 9$.

Combine those: the force will be 4* 9 = 36 times bigger.

Example 4 What if the force doubled and only of the charges changed, becoming three times as big. What must have happened to the separation distance for this to hold true?

Answer:

Let x = factor for distance. Force doubled and charge tripled. Recall distance is related to force by a factor of $1/x^2$.

$2 = 3 * (1/x^2)$

$2x^2 = 3$

$X = \sqrt{\frac{3}{2}} = 1.22$

So the distance between the charges was separated by a factor of 1.22.