PRODUCTS	FACTORS
x^2+2x	$x(x+2)$
x^2-9	$(x+3)(x-3)$
x^2+6x+9	$(x+3)(x+3)$
$x^2+8x+15$	$(x+3)(x+5)$
$x^2-2x-15$	$(x+3)(x-5)$

$x^2-2x-15=(x+3)(x-5)$

27. FACTORING

It is thus seen that factoring is a process which reverses multiplication, that it gives the quantities wich form the product.

By observing each special product, a rule of procedure can be developed for each case.

In the first one, we note that x is common in both terms, therefore it can be removed as it follows:

$$x^2+2x = x\times x + 2\times x = x(x+2)$$

In the second one, we have only two terms, both perfect squares and differing in sign. That being the case, the factors are determined as follows: One factor is composed of the sum of the square roots and the other of the difference of the square roots, thus:

$$x^2-9 = (x+3)(x-3)$$

If a quadratic expression is set equal to zero, we have a quadratic equation. If in any quadratic equation all terms are put on the same side of the equal sign, it is possible that the expression on that side can be factored.

Ex.1: $x^2+2x=0$ whence $x(x+2)=0$

Ex.2: $x^2+8x+15=0$ whence $(x+3)(x+5)=0$

28. Solutions of quadratic equations by factoring

A very important principle must now be introduced. Observe that if $2x=0$, x must be equal 0 sine 2 cannot equal 0. But if $xy=0$, either $x=0$, or $y=0$ or both x and y equal zero will suffice.

That is, if the product of two or more factors is zero, at least one factor must be equal zero.

Thus, our problem resolves itself into finding the values of x that make the various factors zero

2020/10/14