Four prime numbers multiply to 4641. Two of the factors are 7 and 17. Find the other two factors.

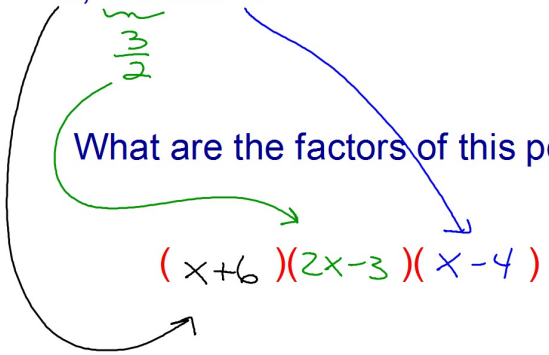
$$\frac{7 \cdot 17 \cdot X \cdot Y}{7} = \frac{4641}{7}$$

$$\frac{17 \cdot X \cdot Y}{17} = \frac{663}{17}$$

$X \cdot Y = 39 \Rightarrow$ The only two prime factors of 39 are

3 & 13

The solutions to a polynomial equation are -6, 1.5 and 4.



-1 and 2 are solutions of the equation below.

$$x^4 - x^3 + 2x^2 - 4x - 8 = 0$$

The other two solutions are imaginary.

How could you find the other two?

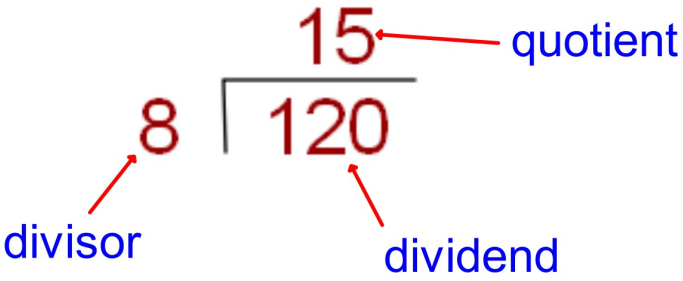
1. Turn -1 and 2 back into their factors: (x+1) and (x-2)
2. Then divide $x^4 - x^3 + 2x^2 - 4x - 8$ by these factors .
3. After division by these two factors you will be left with a Quadratic which you can then solve to find the remaining two solutions. (Factor, Quadratic Formula, Complete the Square, or Square Roots)

Do the following using long division without a calculator.

$\frac{69,132}{22}$ →

$$\begin{array}{r} 3142 \quad R=8 \\ 22 \overline{)\,69132} \\ -66 \\ \hline 31 \\ -22 \\ \hline 93 \\ -88 \\ \hline 52 \\ -44 \\ \hline 8 \end{array}$$

Vocabulary of division.



Polynomial Long Division:

$$\frac{x^2 + 9x + 20}{x + 4} = x + 4 \overline{)\, x^2 + 9x + 20}$$

x in the divisor goes into x^2 of the dividend x times

$$x + 4 \overline{)\, x^2 + 9x + 20} \quad x + 5$$

$$-(x^2 + 4x)$$

$$5x + 20$$

Bring down

multiply x from the quotient by the divisor $x+4$.

SUBTRACT

$$-(5x + 20)$$

$$0$$

No Remainder

$$\frac{x^2+9x+20}{x+4} = x+5$$