Conditions

1.(a) solve the equation x^4-5x^3+11x^2-13x+6=0,given that two of its roots p&q are connected by the relation 3p+2q=7

(b) solve the equation x^4-5x^3+11x^2-13x+6=0 which has two roots whose difference is 1

Solution

(a,b) For solving this, let's factor the left side.

	1	-5	11	-13	6
X=1	1	-4	7	-6	0

$$x^4 - 5x^3 + 11x^2 - 13x + 6 = (x-1)(x^3 - 4x^2 + 7x - 6)$$

	1	-4	7	-6
X=2	1	-2	3	0

$$(x-1)(x^3 - 4x^2 + 7x - 6) = (x-1)(x-2)(x^2 - 2x + 3)$$

As we can see, the discriminant of

$$x^2 - 2x + 3, D = 4 - 12 = -8 < 0$$

This means, that our equation has 2 roots:

$$x_1 = 1, x_2 = 2$$