

LIST 5. Polynomials.

1. Calculate quotient polynomial and the remainder resulting from division transformation of polynomials given below:

a. $P(x)=8x^4+3x^2+5x-6$, $Q(x)=x+1$;

b. $P(x)=x^3+27$, $Q(x)=x^2-3x+9$.

2. If you know one of the roots of the polynomial find the others:

a. $W(x)=x^3-4x^2+x+6$, $x_1=-1$;

b. $W(x)=x^4+x^3-3x^2-5x-2$, $x_1=2$.

3. Not calculating division find the remainder of division transformation the polynomial $P(x)$ by the polynomial $Q(x)$:

a. $P(x)=2x^4+5x^3-7x^2+18x-6$, $Q(x)=x+4$;

b. $P(x)=5x^{103}+6x^{102}-2x+3$, $Q(x)=x+1$;

c. $P(x)=x^{228}-1$, $Q(x)=x^2-1$;

d. $P(x)=2x^5+3x^4-x^3+3x+1$, $Q(x)=(x+2)(x-1)$.

4. Find all integer roots of the polynomial $P(x)$:

a. $P(x)=x^{33}-x^2-4x+4$;

b. $P(x)=2x^3-5x^2-2x-3$.

5. Find all fractal roots of the polynomial $P(x)$:

a. $P(x)=4x^3+x-1$;

a. $P(x)=3x^4-8x^3+6x^2-1$.

6. Decompose of a rational functions into partial fractions:

a. $\frac{1}{x^2(x-1)^2}$;

b. $\frac{x^2}{x^3+2x^2+2x+1}$;

c. $\frac{2x^2+3x-1}{x^3-x}$;

d. $\frac{x}{(x^2+1)^2}$;

e. $\frac{2x^2-6x-9}{x^4+6x^3+9x^2}$;

f. $\frac{10x+3}{x^3+27}$;