

Polinomios

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|---|---|--|------|----------------|-----------------------|--|-----------|--------------------|--|--|--------------------|--|--|------------|--|--|--|
| Expresión algebraica | <ul style="list-style-type: none"> Múltiplo de un numero: nx Partes de un número $\frac{x}{n}$ | <ul style="list-style-type: none"> Número par $2x$ Número impar $2x+1$ Números consecutivos: $x, x+1$ | | | | | | | | | | | | | | | |
| Productos notables | <ul style="list-style-type: none"> $a^2 + 2ab + b^2 = (a+b)^2$ $a^2 - 2ab + b^2 = (a-b)^2$ $a^2 - b^2 = (a-b)(a+b)$ | <ul style="list-style-type: none"> $a^3 + 3a^2b + 3ab^2 + b^3 = (a+b)^3$ $a^3 - 3a^2b + 3ab^2 - b^3 = (a-b)^3$ $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$ $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$ | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none"> Suma de polinomios: $P(x) + Q(x) = 6x^3 - 2x^2 + 1 + x^2 - 2x - 3 = 6x^3 - x^2 - 2x - 2$ Resta de polinomios: $P(x) - Q(x) = 6x^3 - 2x^2 + 1 - (x^2 - 2x - 3) = 6x^3 - 3x^2 + 2x + 4$ Prod. de un número por un polinomio: $5 \cdot P(x) = 5 \cdot (6x^3 - 2x^2 + 1) = 30x^3 - 10x^2 + 5$ Prod. de un monomio por un polinomio: $3x^2 \cdot P(x) = 3x^2 \cdot (6x^3 - 2x^2 + 1) = 18x^5 - 6x^4 + 3x^2$ | | | | | | | | | | | | | | | | |
| Operaciones con polinomios | <ul style="list-style-type: none"> Producto de polinomios: $P(x) \cdot Q(x) = (6x^3 - 2x^2 + 1) \cdot (x^2 - 2x - 3)$ $= 6x^5 - 12x^4 - 18x^3 - 2x^4 + 4x^3 + 6x^2 + x^2 - 2x - 3$ $= 6x^5 - 14x^4 - 14x^3 + 7x^2 - 3$ | | | | | | | | | | | | | | | | |
| Sea: $P(x) = 6x^3 - 2x^2 + 1$ $Q(x) = x^2 - 2x - 3$ | <ul style="list-style-type: none"> División de un polinomio por un número: $\frac{P(x)}{2} = \frac{6x^3 - 2x^2 + 1}{2} = 3x^3 - x^2 + \frac{1}{2}$ División de polinomios: <table style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="text-align: right;">$6x^3 - 2x^2$</td> <td style="text-align: right;">$+1$</td> <td style="border-left: 1px solid black; padding-left: 10px;">$x^2 - 2x - 3$</td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: right;">$-6x^3 + 12x^2 + 18x$</td> <td></td> <td style="border-left: 1px solid black; padding-left: 10px;">$6x + 10$</td> </tr> <tr> <td style="text-align: right;">$-10x^2 + 18x + 1$</td> <td></td> <td style="border-left: 1px solid black;"></td> </tr> <tr> <td style="border-bottom: 1px solid black; text-align: right;">$10x^2 + 20x + 30$</td> <td></td> <td style="border-left: 1px solid black;"></td> </tr> <tr> <td style="text-align: right;">$38x + 31$</td> <td></td> <td style="border-left: 1px solid black;"></td> </tr> </table> | $6x^3 - 2x^2$ | $+1$ | $x^2 - 2x - 3$ | $-6x^3 + 12x^2 + 18x$ | | $6x + 10$ | $-10x^2 + 18x + 1$ | | | $10x^2 + 20x + 30$ | | | $38x + 31$ | | | |
| $6x^3 - 2x^2$ | $+1$ | $x^2 - 2x - 3$ | | | | | | | | | | | | | | | |
| $-6x^3 + 12x^2 + 18x$ | | $6x + 10$ | | | | | | | | | | | | | | | |
| $-10x^2 + 18x + 1$ | | | | | | | | | | | | | | | | | |
| $10x^2 + 20x + 30$ | | | | | | | | | | | | | | | | | |
| $38x + 31$ | | | | | | | | | | | | | | | | | |
| Valor numérico | El valor numérico de un polinomio $P(x)$ en $x=a$ es $P(a)$. | | | | | | | | | | | | | | | | |
| Fraciones algebraicas | Sean P, D y M polinomios: <ul style="list-style-type: none"> $\frac{P_1}{D_1} + \frac{P_2}{D_2} = \frac{\frac{M}{D_1}P_1 + \frac{M}{D_2}P_2}{M}$ donde $M = mcm(D_1, D_2)$ $\frac{P_1}{D_1} \cdot \frac{P_2}{D_2} = \frac{P_1 \cdot P_2}{D_1 \cdot D_2}$ $\frac{P_1}{D_1} : \frac{P_2}{D_2} = \frac{P_1 \cdot D_2}{D_1 \cdot P_2}$ $\frac{P_1}{D_1} \cdot \frac{P_2}{D_2} = \frac{P_1 \cdot P_2}{D_1 \cdot D_2}$ | | | | | | | | | | | | | | | | |
| Teorema del Resto: | <ul style="list-style-type: none"> $P(a) = 0 \Rightarrow x = a$ es raíz de $P(x) \Rightarrow (x - a)$ es un factor de $P(x)$ $P(a) = k \Rightarrow$ el resto de $\frac{P(x)}{x - a}$ es k | | | | | | | | | | | | | | | | |
| Descomposición factorial | <ul style="list-style-type: none"> Sacar factor común Si el grado de $P(x)$ es igual a dos: aplicar fórmula general o productos notables Si el grado de $P(x)$ es mayor que dos: usar Ruffini (Teorema del resto) | | | | | | | | | | | | | | | | |