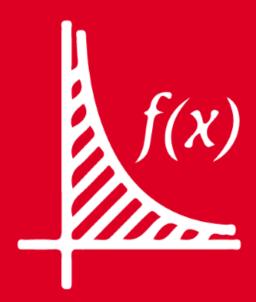


ALGEBRA





Academic advising





Calcule la suma de los factores primos de

$$P(x) = 36x^4 - 25x^2 + 4$$

$$P(x) = 36x^{4} - 25x^{2} + 4$$

$$9x^{2} - 4$$

$$4x^{2} - 1$$

$$P(x) = (9x^2 - 4)(4x^2 - 1)$$

$$P(x) = (3x+2)(3x-2)(2x+1)(2x-1)$$

$$\sum FP = 3x + 2 + 3x - 2 + 2x + 1 + 2x - 1$$

$$\therefore \quad \sum FP = 10x$$



Indique factor un primo luego de factorizar

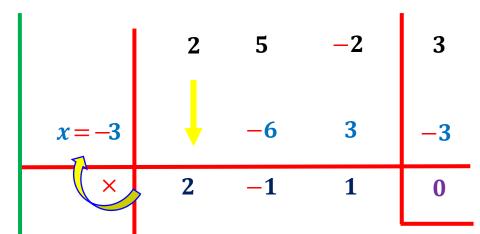
$$Q(x) = 2x^3 + 5x^2 - 2x + 3$$

Resolución:

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

$$a_0 = 2$$
 $a_n = 3$
 $div(a_0) = \{1; 2\}$
 $div(a_n) = \{1; 3\}$

$$PC = \pm \left\{1; 3; \frac{1}{2}; \frac{3}{2}\right\}$$



$$Q(x) = (x+3)(2x^2 - x + 1)$$

Factores primos:

$$(x+3) \mathcal{Y}(2x^2-x+1)$$

◎1

Problema 3

Factorice e indique el número de factores primos

$$R(x) = x^4 - 2x^2 + 5x - 6$$

Resolución:

$$R(x) = x^4 - 2x^2 + 5x - 6$$

Completando el polinomio:

$$R(x) = x^{4} + \underbrace{0x^{3}(-2x^{2}) + 5x - 6}_{-x^{2}}$$

$$x^{2} + x - 3 \rightarrow -3x^{2} \rightarrow +2x^{2} \rightarrow +2x^$$

$$\begin{array}{c|c}
TC = -2x^2 \\
\hline
ST = -x^2
\end{array}$$

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

R(x) tiene 2 factores primos.

Problema 4

Simplifique:

$$M = \sqrt[n]{\sqrt{3} - 2} \cdot \sqrt[2n]{7 - 4\sqrt{3}}$$

Recordemos:

TRINOMIO CUADRADO PERFECTO (Binomio al cuadrado):

$$(a \pm b)^2 = a^2 + b^2 \pm 2ab$$

DIFERENCIA DE CUADRADOS:

$$(a+b)(a-b) = a^2 - b^2$$

$$M = \sqrt[2n]{(\sqrt{3}-2)^2} \cdot \sqrt[2n]{7+4\sqrt{3}}$$

$$M = \sqrt[2n]{7 - 4\sqrt{3}} \cdot \sqrt[2n]{7 + 4\sqrt{3}}$$

$$M = \sqrt[2n]{(7 - 4\sqrt{3})(7 + 4\sqrt{3})}$$

$$M = \sqrt[2n]{7^2 - \left(4\sqrt{3}\right)^2}$$

$$M = \sqrt[2n]{49 - 16.3}$$

$$M = \sqrt[2n]{1}$$

$$M = 1$$

Problema 5

Racionalice

$$E=\frac{10}{\sqrt[7]{16}}$$



$$E=\frac{10}{\sqrt[7]{16}}$$

$$E = \frac{10}{\sqrt[7]{2^4}} \times \frac{\sqrt[7]{2^{7-4}}}{\sqrt[7]{2^{7-4}}}$$

$$E = \frac{10 \sqrt[7]{2^3}}{\sqrt[7]{2^4} \cdot \sqrt[7]{2^3}}$$

$$E = \frac{10\sqrt[7]{8}}{\sqrt[7]{2^7}}$$

$$E = \frac{10\sqrt[7]{8}}{2}$$

$$\therefore E = 5\sqrt[7]{8}$$

Problema 6

Reduzca

$$R = \sqrt{8 + \sqrt{28}} - \sqrt{10 - \sqrt{84}} + \sqrt{7 - \sqrt{48}}$$

Recordemos:

$$\sqrt{A \pm \sqrt{B}} = \sqrt{(x+y) \pm 2\sqrt{x} \cdot y} = \sqrt{x} \pm \sqrt{y}$$

Resolución:

$$R = \sqrt{8 + \sqrt{28}} - \sqrt{10 - \sqrt{84}} + \sqrt{7 - \sqrt{48}}$$

$$R = \sqrt{8 + \sqrt{4} \cdot \sqrt{7}} - \sqrt{10 - \sqrt{4} \cdot \sqrt{21}} + \sqrt{7 - \sqrt{4} \cdot \sqrt{12}}$$

$$R = \sqrt{8 + 2\sqrt{7}} - \sqrt{10 - 2\sqrt{21}} + \sqrt{7 - 2\sqrt{12}}$$

$$7 + 1 \quad 7 \times 1 \quad 7 + 3 \quad 7 \times 3 \quad 4 + 3 \quad 4 \times 3$$

$$R = \sqrt{7} + \sqrt{1} - (\sqrt{7} - \sqrt{3}) + \sqrt{4} - \sqrt{3}$$

$$R = \sqrt{7} + \sqrt{1} - \sqrt{7} + \sqrt{3} + \sqrt{4} - \sqrt{3}$$

$$R=1+2$$

 $\therefore R=3$

Si
$$z_1 = 7 + 3i$$

 $z_2 = 1 - 5i$

al efectuar

$$z = \overline{z}_1.z_2^*$$

la diferencia entre la parte real y la parte imaginaria de z representa la edad de la profesora Verónica hace dos años. ¿Cuántos años tiene la profesora actualmente?

Recordemos:

Sea:
$$z = a + bi$$

Conjugado de z:
$$\bar{z} = a - bi$$

$$\bar{z} = a - bi$$

$$z^* = -a - bi$$

Resolución:

$$z = \overline{z}_1. z_2^*$$

$$z = (7 - 3i)(-1 + 5i)$$

$$z = -7 + 35i + 3i - 15i^2$$

$$z = -7 + 35i + 3i + 15$$

$$z=38i+8$$

Edad de la profesora Verónica hace 2 años:

$$38 - 8 = 30 \ a\tilde{n}os$$

: La profesora Verónica tiene 32 años.

Problema 8

Luego de efectuar:

$$z = \frac{15i^{72}(3-i)}{2+i^{83}}; \quad (i = \sqrt{-1})$$

Calcule Im(z)

Recordemos:

POTENCIAS DE i:

$$i^{4k} = 1$$

$$i^{4k+1}=i$$

$$i^{4k+2}=-1$$

$$i^{4k+3} = -i$$

$$z = \frac{15i^{72}(3-i)}{2+i^{83}}$$

$$z = \frac{15(1)(3-i)}{(2-i)} \times \frac{(2+i)}{(2+i)}$$

$$z = \frac{15(6+3i-2i-i^2)}{4-i^2}$$

$$z = \frac{15(6+3i-2i+1)}{4+1}$$

$$z = \frac{3}{25(7+i)}$$

$$z = 21 + 3i$$

$$\therefore Im(z)=3$$

Sea
$$z_1 = -3 - 5i$$
 $z_2 = 6 + 4i$ $z_3 = -1 + 7i$

Si
$$z = \overline{z}_1 - z_2 + z_3^*$$

calcule |Z|

Recordemos:

Sea:
$$z = a + bi$$

$$\overline{z} = a - bi$$

$$z^* = -a - bi$$

$$|z| = \sqrt{a^2 + b^2}$$

Resolución:

$$z = \overline{z}_1 - z_2 + z_3^*$$

$$z = (-3 + 5i) - (6 + 4i) + (1 - 7i)$$

$$z = -3 + 5i - 6 - 4i + 1 - 7i$$

$$z = -8 - 6i$$

Nos piden: |z|

$$|\mathbf{z}| = \sqrt{(-8)^2 + (-6)^2}$$

$$|z| = \sqrt{100}$$

$$|z| = 10$$

Problema 10

Efectúe

$$P = 20 \left[\frac{3+i}{3-i} - \frac{3-i}{3+i} \right] ; (i = \sqrt{-1})$$

Recordemos:

IDENTIDAD DE LEGENDRE:

$$(a+b)^2 - (a-b)^2 = 4ab$$

DIFERENCIA DE CUADRADOS:

$$(a+b)(a-b) = a^2 - b^2$$

$$P = 20 \left[\frac{3+i}{3-i} - \frac{3-i}{3+i} \right]$$

$$P = 20 \left[\frac{(3+i)^2 - (3-i)^2}{(3-i)(3+i)} \right]$$

$$P = 20 \left[\begin{array}{c|c} 4 & (3) & (i) \\ \hline 9 & - & (i^2) \end{array} \right]$$

$$P = \begin{array}{c} 2 \\ 20 \end{array} \left[\begin{array}{c} 12i \\ 16 \end{array} \right]$$

$$P = 24i$$