

ALGEBRA





Retroalimentación

Tomo 5



Calcule el número de factores primos luego de factorizar

$$P(x) = 18x^4 + x^2 - 4$$

Resolución:

$$P(x) = 18x^{4} + x^{2} - 4$$

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

$$2x^{2} + 1$$

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

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

P(x) tiene 3 factores primos

Indique un factor primo luego de factorizar

$$R(x) = x^3 + x^2 - 13x + 3$$

Resolución:

$$R(x) = x^3 + x^2 - 13x + 3$$

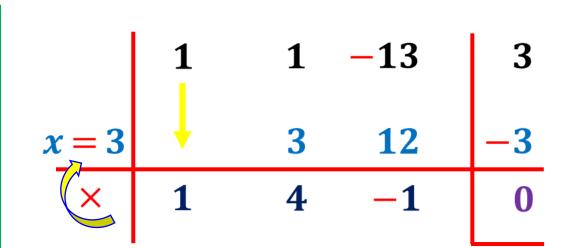
$$R(x) = x^3 + x^2 - 13x + 3$$

$$a_0 = 1$$
 $a_n = 3$

$$div(a_0) = \{1\}$$

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

$$PC = \pm \{1; 3\}$$



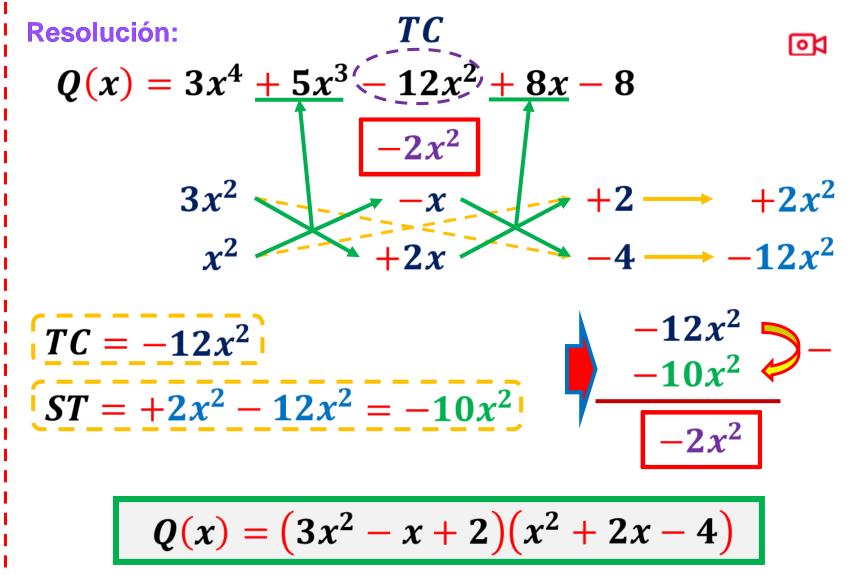
$$R(x) = (x-3)(x^2+4x-1)$$

Factores primos:

$$(x-3)$$
 y (x^2+4x-1)

Calcule el número de factores primos luego de factorizar

$$Q(x) = 3x^4 + 5x^3 - 12x^2 + 8x - 8$$



Q(x) tiene 2 factores primos.

Calcule:

$$A = \frac{2\sqrt{27} + \sqrt{48} + \sqrt{12}}{\sqrt{75} - \sqrt{3}}$$

$$A = \frac{2\sqrt{27} + \sqrt{48} + \sqrt{12}}{\sqrt{75} - \sqrt{3}}$$

$$A = \frac{2\sqrt{9}\sqrt{3} + \sqrt{16}\sqrt{3} + \sqrt{4}\sqrt{3}}{\sqrt{25}\sqrt{3} - \sqrt{3}}$$

$$A = \frac{2.3\sqrt{3} + 4\sqrt{3} + 2\sqrt{3}}{5\sqrt{3} - \sqrt{3}}$$

$$A = \frac{6\sqrt{3} + 4\sqrt{3} + 2\sqrt{3}}{5\sqrt{3} - \sqrt{3}}$$

$$A = \frac{12\sqrt{3}}{4\sqrt{3}}$$

$$\therefore A = 3$$

Reduzca

$$Q = \sqrt{6 + 2\sqrt{8}} + \sqrt{5 - 2\sqrt{6}} + \sqrt{12 - 2\sqrt{27}}$$

Recordemos:

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

$$Q = \sqrt{6 + 2\sqrt{8} + \sqrt{5 - 2\sqrt{6} + \sqrt{12 - 2\sqrt{27}}}_{4+2}$$

$$4+2 \quad 4\times2 \quad 3+2 \quad 3\times2 \quad 9+3 \quad 9\times3$$

$$Q = \sqrt{4} + \sqrt{2} + \sqrt{3} - \sqrt{2} + \sqrt{9} - \sqrt{3}$$

$$Q = 2 + 3$$

$$Q = 5$$

Reduzca

$$R = \frac{6}{\sqrt{8} + \sqrt{5}} + \frac{8}{3 - \sqrt{5}} - 2\sqrt{8}$$

Resolución:

$$R = \frac{6}{\sqrt{8} + \sqrt{5}} + \frac{8}{3 - \sqrt{5}} - 2\sqrt{8}$$

Reduzca
$$R = \frac{6}{\sqrt{8} + \sqrt{5}} + \frac{8}{3 - \sqrt{5}} - 2\sqrt{8}$$

$$R = \frac{6}{(\sqrt{8} + \sqrt{5})} \times \frac{(\sqrt{8} - \sqrt{5})}{(\sqrt{8} - \sqrt{5})} + \frac{8}{(3 - \sqrt{5})} \times \frac{(3 + \sqrt{5})}{(3 + \sqrt{5})} - 2\sqrt{8}$$

$$R = \frac{6(\sqrt{8} - \sqrt{5})}{8 - 5} + \frac{8(3 + \sqrt{5})}{9 - 5} - 2\sqrt{8}$$

$$R = \frac{{}^{2}6(\sqrt{8} - \sqrt{5})}{3_{1}} + \frac{{}^{2}8(3 + \sqrt{5})}{4_{1}} - 2\sqrt{8}$$

$$R = 2\sqrt{8} - 2\sqrt{5} + 6 + 2\sqrt{5} - 2\sqrt{8}$$

$$\therefore R=6$$

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Reduzca

$$M = \frac{5i^{2325} - 7i^{7455}}{2i^{9412} - i^{5474}}; \quad (i = \sqrt{-1})$$

Recordemos:

POTENCIAS DE i:

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

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

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

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

$$M = \frac{5i^{2325} - 7i^{7455}}{2i^{9412} - i^{5474}}$$

$$i^{2325} = i^{2324+1} = i^{4k+1} = i$$

$$i^{7455} = i^{7452+3} = i^{4k+3} = -i$$

$$i^{9412} = i^{9412} = i^{4k} = 1$$

$$i^{5474} = i^{5472+2} = i^{4k+2} = -1$$

$$M = \frac{5(i) - 7(-i)}{2(1) - (-1)} = \frac{5i + 7i}{2 + 1} = \frac{12i}{3}$$

$$M = 4i$$

Sea
$$z_1 = 3 - 2i$$

$$z_2 = 3 - 8i$$

$$z_3 = 5 - 6i$$

Si
$$z = z_1 + z_2^* + \bar{z}_3$$

calcule |Z|

Recordemos:

Sea: z = a + bi

Conjugado de z:

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

Opuesto de z:

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

Módulo de z:

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

Resolución:

$$z = z_1 + z_2^* + \overline{z}_3$$

$$z = (3-2i) + (-3+8i) + (5+6i)$$

$$z = 3 - 2i - 3 + 8i + 5 + 6i$$

$$z = 5 + 12i$$

Nos piden: z

$$|z| = \sqrt{5^2 + 12^2}$$

$$|z| = \sqrt{169}$$

$$|z| = 13$$

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Luego de efectuar

$$z = \frac{2(3-i)}{2+i} + 5 - 3i$$

calcule Re(z)

$$z = \frac{2(3-i)}{2+i} + 5 - 3i$$

$$z = \frac{2(3-i)}{2+i} + 5 - 3i \qquad z = \frac{2(3-i)(2-i)}{(2+i)(2-i)} + 5 - 3i$$

$$z = \frac{2(6-3i-2i+i^2)}{4-i^2} + 5-3i$$

$$z = \frac{2(6-3i-2i-1)}{4+1} + 5 - 3i$$

$$z = \frac{2(5-5i)}{5} + 5 - 3i$$

$$z = \frac{2.5(1-i)}{5} + 5 - 3i$$

$$z = 2 - 2i + 5 - 3i$$

$$z = 7 - 5i$$

$$\therefore Re(z) = 7$$

al efectuar

$$M = z_1^* \cdot \overline{z}_2 + 10 + 26i$$

el valor de M en soles representa el precio de 1 Kg. I de azúcar. Si José compró un saco de 25 Kg, ¿cuál es el precio que pagó?

Recordemos:

Sea: z = a + bi

Conjugado de z:

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

Opuesto de z:

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

$M = z_1^* \cdot \bar{z}_2 + 10 + 26i$

Resolución:

$$M = (-3 - 4i)(5 + 2i) + 10 + 26i$$

$$M = -15 - 6i - 20i - 8i^{2} + 10 + 26i$$

$$M = -15 - 6i - 20i + 8 + 10 + 26i$$



∴ José pagó \$/.75