

ALGEBRA

5th

OF SECONDARY



ASESORÍA 3



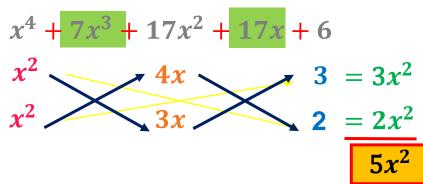


1. Factorice e indique el factor primo de mayor suma de coeficientes

$$P(x) = x^4 + 7x^3 + 17x^2 + 17x + 6$$

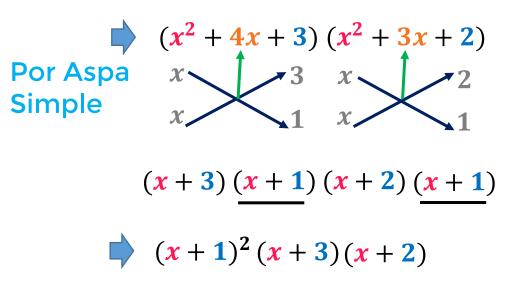
RESOLUCIÓN

Por Aspa Doble Especial



Entonces falta:

$$17x^2 - 5x^2 = 12x^2$$



Nos piden

$$(x+3)$$

2. Indique la suma de factores primos, luego de factorizar:

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

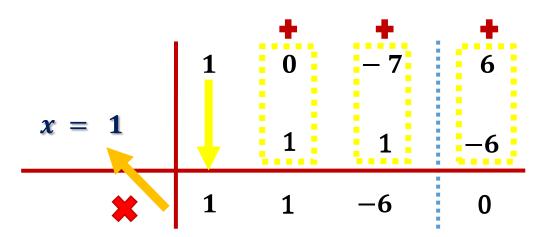
RESOLUCIÓN:

$$P(x) = x^3 \left(x^3 - 7x + 6 \right)$$

Por divisores binómicos:

P. C =
$$\pm \{1; 2; 3; 6\}$$

Si x = 1 \Rightarrow 1³ - 7(1) + 6 = 0 (CUMPLE)



$$P(x) = x^{3} (x - 1) (x^{2} + x - 6)$$

$$x - 3$$

$$x - 2$$

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

FACTORES PRIMOS
$$\begin{array}{c}
\checkmark & x \\
\checkmark & x - 1 \\
\checkmark & x + 3 \\
\checkmark & x - 2
\end{array}$$

 \therefore Suma de factores primos: 4x



3. La suma de los factores primos resulta ax + by + cz

$$x^2 + 2xy + y^2 + 3xz + 3yz - 4z^2$$

Halle a.b.c

RESOLUCIÓN:

Por aspa doble



$$x^{2} + 2xy + y^{2} + 3xz + 3yz - 4z^{2}$$
 $x - y - 4z$
 $x - y - -z$

$$\begin{array}{ccc}
xy & -yz \\
xy & 4yz \\
\hline
2xy & 3yz
\end{array}$$

$$(x+y+4z)(x+y-z)$$

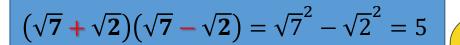
$$\sum_{a} F.P = 2x + 2y + 3z$$

$$abc = 12$$



4. Efectúe:

$$K = \frac{15}{\sqrt{7} + \sqrt{2}} + \frac{14}{\sqrt{7}} - \frac{10}{\sqrt{2}}$$





RESOLUCIÓN:

Multiplicamos a cada término por su factor racionalizante

$$K = \frac{15}{\sqrt{7} + \sqrt{2}} \times \frac{\sqrt{7} - \sqrt{2}}{\sqrt{7} - \sqrt{2}} + \frac{14}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} - \frac{10}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$$

$$K = 3(\sqrt{7} - \sqrt{2}) + 2(\sqrt{7}) - 5(\sqrt{2})$$

$$K = 3\sqrt{7} - 3\sqrt{2} + 2\sqrt{7} - 5\sqrt{2}$$

$$\therefore K = 5\sqrt{7} - 8\sqrt{2}$$

01

5. Reduce la siguiente expresión:

$$R = \sqrt{15 + \sqrt{216}} - \sqrt{14 - 6\sqrt{5}} - \sqrt{6}$$

RESOLUCIÓN:

$$=\sqrt{9}+\sqrt{6}=3+\sqrt{6}$$

RECORDAR:

Si a > b, entonces:

$$\sqrt{(a+b)\pm 2\sqrt{a.\,b}}=\sqrt{a}\pm\sqrt{b}$$

$$\sqrt{216}=\sqrt{4}\sqrt{54}=2\sqrt{54}$$

$$6\sqrt{5} = 2.3\sqrt{5} = 2\sqrt{9}\sqrt{5} = 2\sqrt{45}$$

Reemplazando en R:



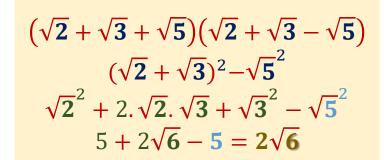


$$\therefore R = \sqrt{5}$$



6. Efectúe:

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





RESOLUCIÓN:

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





$$\mathbf{R} = \sqrt{2} + \sqrt{3} - \sqrt{5} - \sqrt{2} - \sqrt{3}.$$

$$\therefore R = -\sqrt{5}$$

PROBLEMA 7

Calcule:

$$M = \sqrt{14 + \sqrt{180}} + \sqrt{10 - \sqrt{96}} - (\sqrt{5} + \sqrt{6})$$

, dé como respuesta 2M.

Resolución

$$M = \sqrt{14 + \sqrt[4]{180}} + \sqrt{10 - \sqrt[4]{96}} - (\sqrt{5} + \sqrt{6})$$

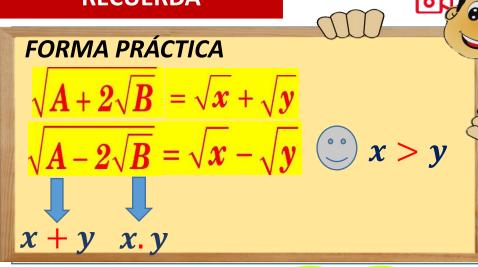
$$M = \sqrt{14 + 2\sqrt{45} + \sqrt{10} - 2\sqrt{24} - \sqrt{5} - \sqrt{6}}$$

$$\cancel{9} + \cancel{5} \qquad \cancel{9} + \cancel{5} \qquad \cancel{6} + \cancel{4} \qquad \cancel{6} \cdot \cancel{4}$$

$$M = \sqrt{9} + \sqrt{5} + \sqrt{6} - \sqrt{4} - \sqrt{5} - \sqrt{6}$$

$$M = 3 - 2$$
$$M = 1$$

RECUERDA



$$\sqrt{180} = \sqrt{4.45} = 2\sqrt{45}$$

$$\sqrt{96} = \sqrt{4.24} = 2\sqrt{24}$$

V Recuerda

Piden
$$\therefore 2M = 2$$



$$A = \frac{i^{428} + i^{817} + 3i^{721} + i^{342} + 2i^{755}}{i^{221} + 4i^{436} + i^{473} - 2i^{469}}$$

Resolución

k es ENTERO

$$A = \frac{i^{4k} + i^{4k+1} + 3i^{4k+1} + i^{4k+2} + 2i^{4k+3}}{i^{4k+1} + 4i^{4k} + i^{4k+1} - 2i^{4k+1}}$$

$$A = \frac{1+i+3i+(-1)+2(-i)}{i+4(1)+i-2i} = \frac{2i}{4} = \frac{i}{2}$$

$$\therefore A = \frac{i}{2}$$



$$z_1 = 5 + 7i$$
 $z_2 = 8 - 4i$
 $Calcule: z_1^* + \overline{z_2} - 2\overline{z_1}$

Resolución

$$z_1 = 5 + 7i$$

$$z_1^* = 5 - 7i$$

$$z_1^* = -5 - 7i$$

$$z_2 = 8 - 4i \quad \Longrightarrow \quad \overline{z_2} = 8 + 4i$$

Piden:
$$-5 - 7i + 8 + 4i - 2(5 - 7i)$$

$$-7+11i$$

 $| \div -7 + 11i |$

PROBLEMA 10 Si:
$$\frac{5+2i}{3+4i} = a + bi$$
 Calcule: $\frac{b}{a}$



Resolución

$$\frac{(5+2i)}{(3+4i)} \frac{(3-4i)}{(3-4i)} = \frac{(15-20i+6i-8i^2)}{9-16i^2} = \frac{23-14i}{25}$$

$$\frac{23}{25} - \frac{14}{25}i = a + bi$$

$$a = \frac{23}{25}$$
; $b = \frac{-14}{25}$

$$\frac{b}{a} = \frac{-14}{23}$$

$$\therefore \frac{b}{a} = \frac{-14}{23}$$