

ALGEBRA

5th
of SECONDARY



ASESORÍA 2ºMENSUAL





1. Indicar un factor primo del polinomio:

$$m^2 - n^2 - 8m + 16$$

RESOLUCIÓN:

Agrupando convenientemente

$$\frac{m^2 - 8m + 16 - n^2}{(m - 4)^2 - n^2}$$

$$\underbrace{(m-4+n)}(m-4-n)$$

FACTOR PRIMO

FACTOR PRIMO

RECORDAR:

$$\checkmark a^2 - 2ab + b^2 = (a - b)^2$$

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

∴ Un factor primo es:

$$(m+n-4) \lor (m-n-4)$$



2. Factorice: $m^6n^4 + 3m^4n^4 - 2m^5n^4 - 6m^3n^4$. Luego, indique el número de factores primos.

RESOLUCIÓN:

Extraemos el factor común de cada término

$$m^3n^4[\underline{m^3 + 3m} - 2\underline{m^2 - 6}]$$

 $m^3n^4[\underline{m(m^2 + 3)} - 2(\underline{m^2 + 3})]$

$$m^3n^4 (m^2+3)(m-2)$$

∴ Número de factores primos: 4

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

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

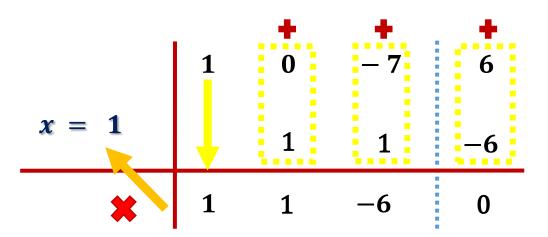
RESOLUCIÓN:

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

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



4. 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



$$x^{2} + 2xy + y^{2} + 3xz + 3yz - 4z^{2}$$
 $x - 1 - y - 4z$
 $x - y - -z$

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

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

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

$$\therefore abc = 12$$



5. Efectúe:

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

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



RESOLUCIÓN:

Multiplicamos a cada término por su factor racionalizante

$$K = \underbrace{\frac{15}{\sqrt{7} + \sqrt{2}}}_{5} \times \frac{\sqrt{7} - \sqrt{2}}{\sqrt{7} - \sqrt{2}} + \underbrace{\frac{14}{\sqrt{7}}}_{7} \times \frac{\sqrt{7}}{\sqrt{7}} - \underbrace{\frac{10}{\sqrt{2}}}_{2} \times \frac{\sqrt{2}}{\sqrt{2}}$$

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

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

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

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6. 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:



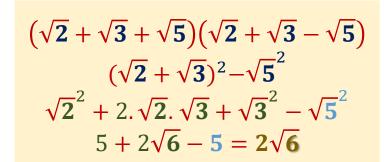
$$R = 3 + \sqrt{6} - 3 + \sqrt{5} - \sqrt{6}$$

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



7. Efectúe:

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





RESOLUCIÓN:

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





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

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

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8. Simplificar:

$$Q = \left(\frac{18! + 19! + 20!}{18! + 19!}\right) + \left(\frac{81!}{79! + 80!}\right)$$

RESOLUCIÓN:

POR PROPIEDADES:

$$Q = \frac{20^2 \cdot 18!}{20 \cdot 18!} + \frac{81 \cdot 80 \cdot 79!}{81 \cdot 79!}$$



$$Q = 20$$



$$Q = 100$$

RECORDAR:

$$a! = a \cdot (a-1)(a-2)!$$

$$a! + (a + 1)! = (a + 2) \cdot a!$$

$$a! + (a + 1)! + (a + 2)! = (a + 2)^2$$
. $a!$

 $\therefore Q = 100$



9. Halle el valor de "x", en:

$$\frac{(x+1)!}{(x-2)!+(x-1)!}=5!$$

RESOLUCIÓN:

$$\frac{(x+1)!}{(x-2)! + (x-1)!} = 5!$$

$$\frac{(x+1).x.(x-1)(x-2)!}{x.(x-2)!} = 5!$$

RECORDAR:

$$a! = a \cdot (a-1)!$$

$$a! + (a + 1)! = (a + 2) \cdot a!$$

$$(x+1)(x-1) = 120$$

$$(x+1)(x-1) = 12 \times 10$$

$$\therefore x = 11$$



10. Halle el valor de n y k en

$$C_9^{17} + 2C_{10}^{17} + C_{11}^{17}$$

Si es igual a C_k^n . Dé como respuesta el valor de n+k.

RESOLUCIÓN:

$$C_{9}^{17} + 2C_{10}^{17} + C_{11}^{17}$$

$$C_{9}^{17} + C_{10}^{17} + C_{10}^{17} + C_{11}^{17}$$

$$C_{10}^{18} + C_{11}^{18}$$

$$C_{11}^{19} = C_{8}^{19}$$

$$n = 19 \land k = 8$$
 \lor $n = 19 \land k = 11$

$$\therefore n+k=27 \lor n+k=30$$