

MULTIPLICACIÓN DE RADICALES

Usamos las reglas del álgebra:

$$\begin{aligned}a(b + c) &= ab + ac \\(a + b)(c + d) &= ac + ad + bc + bd \\(a + b)^2 &= a^2 + 2ab + b^2 \\(a - b)^2 &= a^2 - 2ab + b^2 \\(a + b)(a - b) &= a^2 - b^2\end{aligned}$$

EJEMPLO 1:

Simplifica:

a $\sqrt{2}(\sqrt{2} + \sqrt{3})$

b $\sqrt{3}(6 - 2\sqrt{3})$

a $\begin{aligned}\sqrt{2}(\sqrt{2} + \sqrt{3}) \\&= \sqrt{2} \times \sqrt{2} + \sqrt{2} \times \sqrt{3} \\&= 2 + \sqrt{6}\end{aligned}$

b $\begin{aligned}\sqrt{3}(6 - 2\sqrt{3}) \\&= (\sqrt{3})(6 - 2\sqrt{3}) \\&= (\sqrt{3})(6) + (\sqrt{3})(-2\sqrt{3}) \\&= 6\sqrt{3} - 6 \\&= 6\sqrt{3} - 6\end{aligned}$

1. Simplifica en tu cuaderno y selecciona la opción correcta:

a $\sqrt{2}(\sqrt{5} + \sqrt{2})$

b $\sqrt{2}(3 - \sqrt{2})$

c $\sqrt{3}(\sqrt{3} + 1)$

d $-\sqrt{3}(1 + \sqrt{3})$

e $-\sqrt{3}(\sqrt{3} + 2)$

f $-\sqrt{5}(2 + \sqrt{5})$

g $\sqrt{11}(2\sqrt{11} - 1)$

h $\sqrt{6}(1 - 2\sqrt{6})$

i $\sqrt{3}(\sqrt{3} + \sqrt{2} - 1)$

j $-\sqrt{11}(2 - \sqrt{11})$

k $-(\sqrt{3} - \sqrt{7})$

l $-2\sqrt{2}(1 - \sqrt{2})$

EJEMPLO 2:

Simplifica:

$$(3 - \sqrt{2})(4 + 2\sqrt{2})$$

$$\begin{aligned} & (3 - \sqrt{2})(4 + 2\sqrt{2}) \\ &= (3 - \sqrt{2})(4) + (3 - \sqrt{2})(2\sqrt{2}) \\ &= 12 - 4\sqrt{2} + 6\sqrt{2} - 4 \\ &= 8 + 2\sqrt{2} \end{aligned}$$

2. Simplifica en tu cuaderno y selecciona la opción correcta:

a $(1 + \sqrt{2})(2 + \sqrt{2})$

b $(2 + \sqrt{3})(2 + \sqrt{3})$

c $(\sqrt{3} + 2)(\sqrt{3} - 1)$

d $(4 - \sqrt{2})(3 + \sqrt{2})$

e $(1 + \sqrt{3})(1 - \sqrt{3})$

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

EJEMPLO 3:

Simplifica:

a $(\sqrt{3} + 2)^2$

b $(\sqrt{3} - \sqrt{7})^2$

a
$$\begin{aligned} &(\sqrt{3} + 2)^2 \\ &= (\sqrt{3})^2 + 2 \times \sqrt{3} \times 2 + 2^2 \\ &= 3 + 4\sqrt{3} + 4 \\ &= 7 + 4\sqrt{3} \end{aligned}$$

b
$$\begin{aligned} &(\sqrt{3} - \sqrt{7})^2 \\ &= (\sqrt{3})^2 - 2 \times \sqrt{3} \times \sqrt{7} + (\sqrt{7})^2 \\ &= 3 - 2\sqrt{21} + 7 \\ &= 10 - 2\sqrt{21} \end{aligned}$$

3. Simplifica en tu cuaderno y selecciona la opción correcta:

a $(1 + \sqrt{2})^2$

b $(2 - \sqrt{3})^2$

c $(\sqrt{3} + 2)^2$

d $(1 + \sqrt{5})^2$

e $(\sqrt{2} - \sqrt{3})^2$

f $(5 - \sqrt{2})^2$

g $(\sqrt{2} + \sqrt{7})^2$

h $(4 - \sqrt{6})^2$

i $(\sqrt{6} - \sqrt{2})^2$

EJEMPLO 4:

Simplifica:

a $(3 + \sqrt{2})(3 - \sqrt{2})$

b $(2\sqrt{3} - 5)(2\sqrt{3} + 5)$

a
$$\begin{aligned} & (3 + \sqrt{2})(3 - \sqrt{2}) \\ &= 3^2 - (\sqrt{2})^2 \\ &= 9 - 2 \\ &= 7 \end{aligned}$$

b
$$\begin{aligned} & (2\sqrt{3} - 5)(2\sqrt{3} + 5) \\ &= (2\sqrt{3})^2 - 5^2 \\ &= (4 \times 3) - 25 \\ &= 12 - 25 \\ &= -13 \end{aligned}$$

4. Simplifica en tu cuaderno y selecciona la opción correcta:

a $(4 + \sqrt{3})(4 - \sqrt{3})$

b $(5 - \sqrt{2})(5 + \sqrt{2})$

c $(\sqrt{5} - 2)(\sqrt{5} + 2)$

d $(\sqrt{7} + 4)(\sqrt{7} - 4)$

e $(3\sqrt{2} + 2)(3\sqrt{2} - 2)$

f $(2\sqrt{5} - 1)(2\sqrt{5} + 1)$

5. Simplifica en tu cuaderno y selecciona la opción correcta:

a $(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})$

b $(\sqrt{7} + \sqrt{11})(\sqrt{7} - \sqrt{11})$

c $(\sqrt{x} - \sqrt{y})(\sqrt{y} + \sqrt{x})$