DIFERENCIA DE CUADRADOS E IDENTIDAD DE LEGENDRE

Binomio suma por binomio diferencia

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

Ejemplos:

- $(x + 2)(x - 2) = (x)^2 - 2^2$
  $= x^2 - 4$
- $(3x + 5)(3x - 5) = (3x)^2 - (5)^2$
  $= 9x^2 - 25$
- $(a^2 - b^3)(a^2 + b^3) = (a^2)^2 - (b^3)^2$
  $= a^4 - b^6$
- $(4x^2 - y)(4x^2 + y) = (4x^2)^2 - (y)^2$
  $= 16x^4 - y^2$
- $(\sqrt{5} + \sqrt{3})(\sqrt{5} - \sqrt{3}) = (\sqrt{5})^2 - (\sqrt{3})^2$
  $= 5 - 3 = 2$

Identidades de Legendre

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

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

Ejemplos:

- $(x + 5)^2 \oplus (x - 5)^2 = 2(x^2 + 5^2)$
  $= 2(x^2 + 25)$
  $= 2x^2 + 50$
- $(x + 4)^2 \ominus (x - 4)^2 = 4(x)(4)$
  $= 16x$
- $(3a^2 + 5)^2 \ominus (3a^2 - 5)^2 = 4(3a^2)(5)$
  $= 60a^2$
- $(\sqrt{7} + 2)^2 \oplus (\sqrt{7} - 2)^2 = 2(\sqrt{7}^2 + 2^2)$
  $= 2(7 + 4)$
  $= 2(11) = 22$
- $(\sqrt{12} + \sqrt{3})^2 \ominus (\sqrt{12} - \sqrt{3})^2 = 4(\sqrt{12})(\sqrt{3})$
  $= 4(\sqrt{36})$
  $= 4 \cdot 6 = 24$

Trabajando en clase

Integral

1. Resuelve:

a) $A = (x + 7)(x - 7)$
b) $C = (7x - 9)(7x + 9)$
c) $T = (\sqrt{7} + \sqrt{3})(\sqrt{7} - \sqrt{3})$

2. Resuelve:

a) $A = (x + 6)^2 - (x - 6)^2$
b) $E = (a + 2)^2 + (a - 2)^2$
c) $F = (x + 1)^2 - (x - 1)^2$

Calcula (ejercicios del 3 al 6)

3.

$T = (\sqrt{7} + \sqrt{5})(\sqrt{7} - \sqrt{5}) + (\sqrt{2} + 1)(\sqrt{2} - 1)$

PUCP

4.

$M = (x + 5)^2 + (x - 5)^2 - 2x^2$

Resolución:

$M = (x + 5)^2 \oplus (x - 5)^2 - 2x^2$

Legendre

$M = 2(x^2 + 5^2) - 2x^2$
$M = 2(x^2 + 25) - 2x^2$
$M = 2x^2 + 50 - 2x^2$
$M = 50$

5.

$R = (x + 7)^2 - (x - 7)^2 - 2x^2$

6.

$P = (2\sqrt{3} + 3\sqrt{2})(2\sqrt{3} - 3\sqrt{2})$

7. Reduce:
$B = (x + 4)(x - 4) - (x + 8)(x - 8)$

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8. Reduce:

$P = \sqrt{(x^2+25)^2 - (x^2-25)^2}$; $x > 0$

Resolución:

$P = \sqrt{(x^2+25)^2 \ominus (x^2-25)^2}$

Legendre

$P = \sqrt{4(x^2)(25)}$
$P = \sqrt{100x^2}$
$P = \sqrt{100}\sqrt{x^2}$
$P = 10x$

9. Reduce:

$F = \sqrt{(a^2+16)^2 - (a^2-16)^2}$ $\quad a > 0$

Resuelve (ejercicios del 10 al 14)

10.

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

11.

$$T = \frac{(\sqrt{3}-\sqrt{5})(\sqrt{3}+\sqrt{5})}{2}$$

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12.

$F = (m + 1)(m - 1)(m^2 + 1)$

Resolución:

$F = (m + 1)(m - 1)(m^2 + 1)$

Diferencia de cuadrado

$F = (m^2 - 1^2)(m^2 + 1)$
$F = (m^2 - 1)(m^2 + 1)$

Diferencia de cuadrado

$F = (m^2)^2 - (1)^2$
$F = m^4 - 1$

13.

$P = (m + 2)(m - 2)(m^2 + 4)$

14.

$H = \sqrt{(7+2\sqrt{6})(7-2\sqrt{6})}$