

PRODOTTI NOTEVOLI• SOMMA PER DIFFERENZA:

$$(A+B) \cdot (A-B) = A^2 - B^2$$

INFATTI: $(A+B) \cdot (A-B) = A \cdot A - A \cdot B + B \cdot A - B \cdot B =$
 $= A^2 - \cancel{AB} + \cancel{AB} - B^2 = A^2 - B^2$

Es: ① $(X+4) \cdot (X-4) = X^2 - 4^2 = X^2 - 16$
 $A = X$ $B = 4$ [FORMULA: $A^2 - B^2$]

② $(3X+2Y) \cdot (3X-2Y) = (3X)^2 - (2Y)^2 = 9X^2 - 4Y^2$
 $A = 3X$
 $B = 2Y$

• QUADRATO DI BINOMIO:

$$(A+B)^2 = A^2 + B^2 + 2 \cdot A \cdot B$$

INFATTI: $(A+B)^2 = (A+B) \cdot (A+B) = A \cdot A + A \cdot B + B \cdot A + B \cdot B =$
 $= A^2 + AB + AB + B^2 = A^2 + B^2 + 2AB$

$$(A-B)^2 = A^2 + B^2 - 2AB$$

Es: ① $(X+2)^2 = X^2 + 2^2 + 2 \cdot X \cdot 2 = X^2 + 4 + 4X$
 $A = X$
 $B = 2$

② $(4X-Y)^2 = (4X)^2 + Y^2 - 2 \cdot 4X \cdot Y = 16X^2 + Y^2 - 8XY$
 $A = 4X$
 $B = Y$

③ $(2ab-3c)^2 = (2ab)^2 + (3c)^2 - 2 \cdot 2ab \cdot 3c =$
 $= 4a^2b^2 + 9c^2 - 12abc$
 $A = 2ab$
 $B = 3c$

FORMULE:

$$(A+B) \cdot (A-B) = A^2 - B^2$$

$$(A+B)^2 = A^2 + B^2 + 2 \cdot A \cdot B$$

$$(A-B)^2 = A^2 + B^2 - 2 \cdot A \cdot B$$

$$(1) (b+2) \cdot (b-2) = b^2 - 2^2 = b^2 - 4$$

$$(2) (3a+c)(3a-c) = (3a)^2 - c^2 = 9a^2 - c^2$$

$$(3) (x+5y)(x-5y) = x^2 - (5y)^2 = x^2 - 25y^2$$

$$(4) \underline{(m+n) \cdot (m-n) \cdot (m^2+n^2)} = (m^2-n^2) \cdot (m^2+n^2) = (m^2)^2 - (n^2)^2 = m^4 - n^4$$

$$(5) (b+2)^2 = b^2 + 2^2 + 2 \cdot b \cdot 2 = b^2 + 4 + 4b$$

$$(6) (4a+3b)^2 = (4a)^2 + (3b)^2 + 2 \cdot 4a \cdot 3b = 16a^2 + 9b^2 + 24ab$$

$$(7) (5x-y)^2 = (5x)^2 + y^2 - 2 \cdot 5x \cdot y = 25x^2 + y^2 - 10xy$$

$$(8) (3bc-2a)^2 = (3bc)^2 + (2a)^2 - 2 \cdot 3bc \cdot 2a = 9b^2c^2 + 4a^2 - 12abc$$

$$(9) x^2 - a^2 - (x^2 + 4a^2 - 4ax) = \cancel{x^2} - a^2 - \cancel{x^2} - 4a^2 + 4ax = -5a^2 + 4ax$$

$$(10) \left(\frac{1}{2}a\right)^2 - (3b)^2 + 3b^2 = \frac{1}{4}a^2 - \underline{9b^2} + \underline{3b^2} = \frac{1}{4}a^2 - 6b^2$$

$$(11) a^2 + (2b)^2 + 2 \cdot a \cdot 2b - 4ab = a^2 + 4b^2 + 4ab - 4ab = a^2 + 4b^2$$

$$(12) \frac{1}{4}a^2 + b^2 - 2 \cdot \frac{1}{2}a \cdot b - 2ab = \frac{1}{4}a^2 + b^2 - \underline{ab} - \underline{2ab} = \frac{1}{4}a^2 - 3ab + b^2$$

$$(13) (2x)^2 + 1 + 2 \cdot 2x \cdot 1 + x^2 - 1^2 - (x^2 - 2^2) = 4x^2 + \cancel{1} + 4x + \cancel{x^2} - \cancel{1} - \cancel{x^2} + 4 = 4x^2 + 4x + 4$$

ESERCIZI

SVOLGERE I SEGUENTI PRODOTTI NOTEVOLI

- ① $(b+2) \cdot (b-2)$
- ② $(3a+4c) \cdot (3a-4c)$
- ③ $(x+5y) \cdot (x-5y)$
- ④ $(m+n) \cdot (m-n) \cdot (m^2+n^2)$
- ⑤ $(b+2)^2$
- ⑥ $(4a+3b)^2$
- ⑦ $(5x-y)^2$
- ⑧ $(3bc-2a)^2$

RISOLVERE LE SEGUENTI ESPRESSIONI, UTILIZZANDO DOVE POSSIBILE, I PRODOTTI NOTEVOLI:

- ⑨ $(x-a) \cdot (x+a) - (x-2a)^2$
- ⑩ $\left(\frac{1}{2}a+3b\right) \cdot \left(\frac{1}{2}a-3b\right) + 3b^2$
- ⑪ $(a+2b)^2 - 4ab$
- ⑫ $\left(\frac{1}{2}a-b\right)^2 - 2ab$
- ⑬ $(2x+1)^2 + (x+1) \cdot (x-1) - (x+2) \cdot (x-2)$

FORMULE:

$$(A+B) \cdot (A-B) = A^2 - B^2$$

$$(A+B)^2 = A^2 + B^2 + 2 \cdot A \cdot B$$

$$(A-B)^2 = A^2 + B^2 - 2 \cdot A \cdot B$$

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$$(4) \underline{(m+n) \cdot (m-n) \cdot (m^2+n^2)} = (m^2-n^2) \cdot (m^2+n^2) = (m^2)^2 - (n^2)^2 = m^4 - n^4$$

$$(5) (b+2)^2 = b^2 + 2^2 + 2 \cdot b \cdot 2 = b^2 + 4 + 4b$$

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$$(12) \frac{1}{4}a^2 + b^2 - 2 \cdot \frac{1}{2}a \cdot b - 2ab = \frac{1}{4}a^2 + b^2 - \underline{ab} - \underline{2ab} = \frac{1}{4}a^2 - 3ab + b^2$$

$$(13) (2x)^2 + 1 + 2 \cdot 2x \cdot 1 + x^2 - 1^2 - (x^2 - 2^2) = 4x^2 + \cancel{1} + 4x + \cancel{x^2} - \cancel{1} - \cancel{x^2} + 4 = 4x^2 + 4x + 4$$