

я с друзьями на алгебре



$$4)(**) x^3 + y^3 + z^3 - 3xyz = \dots$$

$$5)(*) (x + y + z)^3 - x^3 - y^3 - z^3 = \dots$$

$$7)(*) a^4 - 2a^3 + a^2 - 1 = \dots$$

$$8)(*) c^8 - c^4 - 2c^2 - 1 = \dots$$

$$9)(*) 8x^3 + y^3 + 6y^2 + 12y + 8 = \dots$$

$$x^3 + y^3 + z^3 - 3xyz =$$

$$x^3 + y^3 + z^3 - 3xyz + 3x^2y + 3xy^2 - 3x^2y - 3xy^2 =$$

$$x^3 + 3x^2y + 3xy^2 + y^3 + z^3 - 3xyz - 3x^2y - 3xy^2 =$$

$$= (x+y)^3 + z^3 - 3xyz - 3x^2y - 3xy^2 =$$

$$(x+y)^3 + (z)^3 - 3xy(z+x+y) =$$

$$(x+y+z)((x+y)^2 - (x+y)z + z^2) - 3xy(z+x+y) =$$

$$(x+y+z)((x+y)^2 - (x+y)z + z^2 - 3xy) =$$

$$(x+y+z)(x^2 + y^2 - xz - yz + z^2 - xy) =$$

$$(x+y+z)(x^2 + y^2 + z^2 - xz - yz - xy)$$

$$(x + y + z)^3 - x^3 - y^3 - z^3 =$$

$$(x+y+z-x)((x+y+z)^2 - (x+y+z)x + x^2) - (y+z)(y^2 - zy + z^2) =$$

$$(y+z)(x^2 + y^2 + z^2 + 2xy + 2xz + 2yz - x^2 - xy - zx + x^2) -$$

$$(y+z)(y^2 - zy + z^2) = (y+z)$$

$$((x^2 + y^2 + z^2 + 2xy + 2xz + 2yz - x^2 - xy - zx + x^2) - (y^2 - zy + z^2)) =$$

$$= (y+z)((x^2 + y^2 + z^2 + xy + xz + 2yz) + (-y^2 + zy - z^2)) =$$

$$= (y+z)(x^2 + xy + xz + yz) = (y+z)(x(x+y) + z(x+y)) =$$

$$= (y+z)(x+y)(x+z)$$

$$a^4 - 2a^3 + a^2 - 1 = a^2(a^2 - 2a + 1) - 1 =$$

$$= a^2(a-1)^2 - 1 = ((a^2 - a) - 1)((a^2 - a) + 1) =$$

$$= (a^2 - a - 1)(a^2 - a + 1)$$

$$c^8 - c^4 - 2c^2 - 1 = c^8 - (c^2)^2 - 2c^2 - 1 =$$

$$= c^8 - ((c^2)^2 + 2c^2 + 1) = c^8 - (c^2 + 1)^2 = (c^4 - c^2 - 1)$$

$$(c^4 + c^2 + 1)$$

$$8x^3 + y^3 + 6y^2 + 12y + 8 =$$

$$= 8x^3 + y^3 + 3 \cdot 2 \cdot y^2 + 3 \cdot 2^2 \cdot y + 2^3$$

$$=$$

$$8x^3 + (y+2)^3 = (2x+y+2)(4x^2 - 2x(y+2) +$$

$$+ (y+2)^2) = (2x+y+2)(4x^2 - 2xy - 4x +$$

$$+ y^2 + 4y + 4) =$$