

ALGEBRAIC EXPRESSIONS AND IDENTITIES

IDENTITIES

IDENTITY - 1

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

IDENTITY - 2

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

IDENTITY - 3

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

IDENTITY - 4

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

IDENTITY 1

$$\begin{aligned}(a + b)(a + b) &= a(a + b) + b(a + b) \\ &= a^2 + ab + ba + b^2 \\ &= a^2 + 2ab + b^2\end{aligned}$$

Therefore, $(a + b)^2 = a^2 + 2ab + b^2$

$$\begin{aligned}(2y + 5)(2y + 5) &= (2y + 5)^2 \\ &= (2y)^2 + (5)^2 + (2 * 2y * 5) \\ &= 4y^2 + 25 + 20y\end{aligned}$$



IDENTITY 2

$$\begin{aligned}(a - b)(a - b) &= a(a - b) - b(a - b) \\ &= a^2 - ab - ba + b^2 \\ &= a^2 - 2ab + b^2\end{aligned}$$

Therefore, $(a - b)^2 = a^2 - 2ab + b^2$

$$\begin{aligned}(2a - 7)(2a - 7) &= (2a - 7)^2 \\ &= (2a)^2 + (7)^2 - (2 * 2a * 7) \\ &= 4a^2 + 49 - 28a\end{aligned}$$



IDENTITY 3

$$\begin{aligned}(a - b)(a + b) &= a(a + b) - b(a + b) \\ &= a^2 + ab - ba - b^2 \\ &= a^2 - b^2\end{aligned}$$

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

$$\begin{aligned}(1.1m - 0.4)(1.1m + 0.4) &= (1.1m)^2 - (0.4)^2 \\ &= 1.21m^2 - 0.16\end{aligned}$$



IDENTITY 4

$$\begin{aligned}(x + a)(x + b) &= x(x + b) + a(x + b) \\ &= x^2 + xb + ax + ab \\ &= x^2 + x(a + b) + ab\end{aligned}$$

Therefore, $(x + a)(x + b) = x^2 + (a + b)x + ab$

$$\begin{aligned}(xyz + (-4))(xyz + (-2)) &= (xyz - 4)(xyz - 2) \\ &= (xyz)^2 + (-4 - 2)xyz + (-4 * (-2)) \\ &= x^2y^2z^2 + (-6xyz) + 8 \\ &= x^2y^2z^2 - 6xyz + 8\end{aligned}$$

