Write a quadratic function in standard form for the parabola that passes through the points ( -2 , 30 ) ( 1 , 6 ) and ( 4 , 36 ).

$y = ax^2 + bx + c$

$30 = a(-2)^2 + b(-2) + c$

$30 = 4a - 2b + c$

$y = ax^2 + bx + c$

$6 = a(1)^2 + b(1) + c$

$6 = a + b + c$

$y = ax^2 + bx + c$

$36 = a(4)^2 + b(4) + c$

$36 = 16a + 4b + c$

$30 = 4a - 2b + c$

$6 = a + b + c$

$36 = 16a + 4b + c$

$$4a - 2b + c = 30$$
$$a + b + c = 6$$
$$16a + 4b + c = 36$$

$$\begin{bmatrix} 4 & -2 & 1 \\ 1 & 1 & 1 \\ 16 & 4 & 1 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \end{bmatrix} = \begin{bmatrix} 30 \\ 6 \\ 36 \end{bmatrix}$$

$$A \cdot X = B$$

$$X = \begin{bmatrix} 3 \\ -5 \\ 8 \end{bmatrix}$$

$y = ax^2 + bx + c$

$y = 3x^2 - 5x + 8$