Handout: "Parabolas in Vertex Form"

#1 e) Axis of symmetry: $x = 2$ ← x_{vertex}

$$y = a(x-2)^2 + q$$

Given two points: $(6, -12)$ and $(10, -36)$ on the parabola

> If a point is on the parabola, it satisfies the equation of the parabola.

$$-12 = a(6-2)^2 + q \longrightarrow 16a + q = -12 \quad (1)$$

$$-36 = a(10-2)^2 + q \longrightarrow 64a + q = -36 \quad (2)$$

Subtract the equations: (2) − (1)

$$48a = -24$$

$$a = \frac{-24}{48} = -\frac{1}{2}$$

From (1):

$$q = -12 - 16a$$

$$q = -12 - 16\left(-\frac{1}{2}\right)$$

$$q = -12 + 8$$

$$q = -4$$

Answer: $y = -\frac{1}{2}(x-2)^2 - 4$