(1) (2)

- Consider the parabola described by $y = x^2 + 6x - 7$. Find the x-intercepts, the coordinates of the vertex, and the axis of symmetry. Finally, write the equation in vertex form and sketch the graph. (3) (4) (5)

(1) $x^2+6x-7 = (x+7)(x-1) = 0$

$x = -7, \; x = 1$

X-INTERCEPTS ARE $(-7,0)$ AND $(1,0)$

(2) THE VERTEX IS THE POINT WHERE

$x = \frac{-b}{2a} = \frac{-6}{2(1)} = -3$ AND $y = (-3)^2 + 6(-3) - 7$

$= 9 - 18 - 7 = -16$

VERTEX IS $(-3,-16)$

(3) VERTICAL LINE THROUGH VERTEX : $x = -3$

(4) VERTEX FORM : $y = (x+3)^2 - 16$

(5) THE GRAPH IS THE GRAPH OF $y = x^2$ SHIFTED LEFT 3 UNITS AND DOWN 16 UNITS.