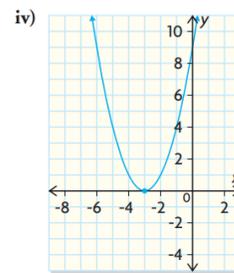# Writing Equations in Vertex Form
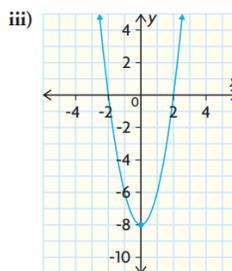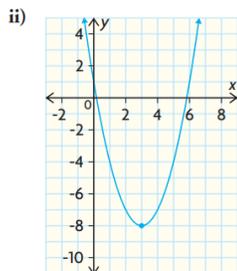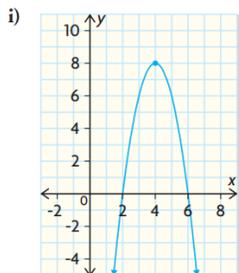
1. Match each equation with the correct graph.

   a) $y = 2x^2 - 8$ b) $y = x^2 + 3$ c) $y = -2(x-4)^2 + 8$ d) $y = (x-3)^2 - 8$

i)
ii)
iii)
iv)

2. The following transformations are applied to the graph of $y = x^2$. Determine the equation of each new relation.
   a) a vertical stretch by a factor of 4, followed by a translation right by 3.
   b) reflection in the x-axis, followed by a translation 2 units up.

3. Write the equation of a parabola with each set of properties.
   a) vertex at (0,4), opens upward, the same shape as $y = x^2$.

   b) vertex at (2,-3), opens upward, narrower than $y = x^2$.

4. Determine the equation of a quadratic relation in vertex form, given the following information.
   a) vertex at (-2,3), passes through (-4,1).
   b) vertex at (-1,-1), passes through (0,1).

5. A child kicks a soccer ball so that it barely clears a 2 m fence. The soccer ball lands 3 m from the fence. Determine the equation, in vertex form, of a quadratic relation that models the path of the ball.

6. The owner of a small clothing company wants to create a mathematical model for the company's daily profit, p, in dollars, based on the selling price, d, in dollars, of the dresses made. The owner has noticed that the maximum daily profit the company has made is $1600. This occurred when the dresses were sold for $75 each. The owner also noticed that selling the dresses for $50 resulted in a profit of $1225. Using a quadratic relation to model this problem, create an equation for the company's daily profit