First name: _____ Last name: _____ Student ID: _____

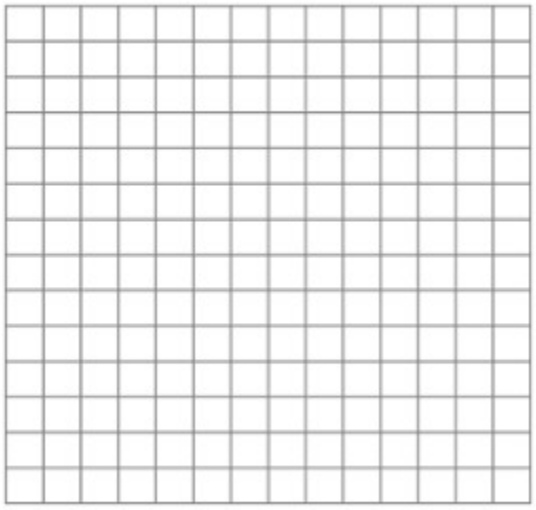
Quadratic Function (3) Homework

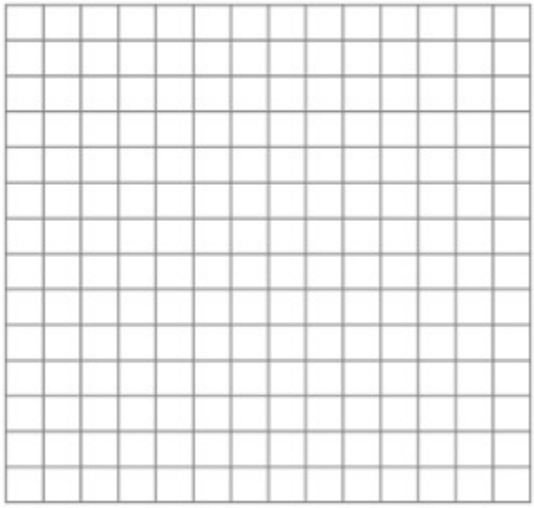
1. Complete the squares to find the vertex and axis of symmetry of each of the following.

(a) $y = x^2 – x – 12$	(b) $y = x^2 + 2x + 3$
(c) $y = 2x^2 – 4x – 1$	(d) $y = -x^2 – 2x + 5$
(e) $y = -2x^2 + x – 5$	(f) $y = 3x^2 - x + 4$

2. Sketch the graph of each function **by completing the squares**. Show the coordinates of the vertex, the equation of axis of symmetry, y-intercept, and x-intercepts

a) $y = x^2 - 8x$ b) $y = 4 - 6x - x^2$





3. Write an equation for a quadratic function in vertex form that passes through a vertex of (2, 2) and the point (3, 4).

4. If the graph of a quadratic function has vertex (3, -1) and its y-intercept is - 4. Find the quadratic function.

5. Quadratic function $y= x^2 + 2x + m$ has its minimum value of 8. Find m.

6. If quadratic function $y = x^2 - 2x + 3 - a$ has only one intersection with x-axis. Find the value of a

7. Consider the flight of an aircraft used to simulate weightlessness**.** Its flight path can be approximated by the following equation: $h = -10t^2 + 300t + 9750$ where h is height in m, and t is time in seconds.
a) Find the maximum altitude

b) Find the number of seconds to reach maximum altitude

c) What is the altitude at t = 20?

8. Greg tosses a basketball over David and into the net. If the ball's height can be represented by h in m and d in meters from the net, by the following equation: h = $\frac{-2}{9}d^2 + \frac{24}{9}d + 3$

a) What is the maximum height of the ball?

b) How far away is the ball at its maximum height?

c) How high is the net?

9. Tanya has a rectangular field to enclose but she only has 600m of fencing. What are the dimensions that give her the maximum area? What is the maximum area?

10. A theater company has 300 season ticket subscribers. The board of directors has decided to raise the price of a season ticket from the current price of $400. A survey of the subscribers has determined that, for every $20 increase in price, 10 subscribers would not renew their season tickets. What price would maximize the revenue from season tickets?