Name: _____ **Algebra II**
Date: **Homework 29**

Problem 1. Write the following functions in the form $f(x) = (x \pm h)^2 \pm k$ by completing the square. Describe how x^2 is shifted to obtain $f(x)$. Graph $f(x)$, label the vertex, label all axis intersections. An example of what I expect is given below.

(a) $f(x) = (x+1)^2 - 2$, x-intercepts: $\{-1 \pm \sqrt{2}\}$, y-intercept: -1, vertex: $(-1, -2)$

(b) $f(x) = \left(x - \frac{7}{2}\right)^2 - \frac{9}{4}$, x-intercepts: $\{2, 5\}$, y-intercept: 10, vertex: $\left(\frac{7}{2}, -\frac{9}{4}\right)$

(c) $f(x) = \left(x + \frac{1}{2}\right)^2 + \frac{3}{4}$, x-intercepts: $\left\{-\frac{1}{2} \pm i\frac{\sqrt{3}}{2}\right\}$, y-intercept: 1, vertex: $\left(-\frac{1}{2}, \frac{3}{4}\right)$

(d) $f(x) = (x-4)^2 - 1$, x-intercepts: $\{3, 5\}$, y-intercept: 15, vertex: $(4, -1)$

(e) $f(x) = \left(x + \frac{3}{2}\right)^2 - \frac{9}{4}$, x-intercepts: $\{-3, 0\}$, y-intercept: 0, vertex: $\left(-\frac{3}{2}, -\frac{9}{4}\right)$

(f) $f(x) = (x-2)^2 + 3$, x-intercepts: $\left\{2 \pm i\sqrt{3}\right\}$, y-intercept: 7, vertex: $(2, 3)$

(g) $f(x) = \left(x + \frac{3}{4}\right)^2 - \frac{5}{16}$, x-intercepts: $\left\{-\frac{3}{4} \pm \frac{\sqrt{5}}{4}\right\}$, y-intercept: $\frac{1}{4}$, vertex: $\left(-\frac{3}{4}, -\frac{5}{16}\right)$

(h) $f(x) = \left(x - \frac{1}{2}\right)^2 - \frac{5}{4}$, x-intercepts: $\left\{\frac{1}{2} \pm \frac{\sqrt{5}}{2}\right\}$, y-intercept: -1, vertex: $\left(\frac{1}{2}, -\frac{5}{4}\right)$

(i) $f(x) = \left(x + \frac{3}{2}\right)^2 - \frac{16}{9}$, x-intercepts: $\left\{-\frac{17}{6}, -\frac{1}{6}\right\}$, y-intercept: $\frac{17}{36}$, vertex: $\left(-\frac{3}{2}, -\frac{16}{9}\right)$