Practice identifying the zeros, vertex and y-intercept in factored form. Then re-write in standard form by simplifying (distributing).

| 1. $f(x) = (x-7)(x+5)$ | 2. $g(x) = -(x-8)(x-2)$ | 3. $h(x) = \frac{1}{3}(x+9)(x-3)$ |
|---|---|---|
| zeros: | zeros: | zeros: |
| vertex: | vertex: | vertex: |
| y-int: | y-int: | y-int: |
| Standard Form: | Standard Form: | Standard Form: |

**Answer the following application problems.**

**4. The height of a swimmers dive off a 10-foot platform into a diving pool is modeled by the equation $y = 2(x-5)(x-1)$, where x represents the number of seconds since the swimmer left the diving board and y represents the number of feet above or below the water's surface. What is the farthest depth below the water's surface that the simmer will reach?**

**5. The owner of an auditorium wants to increase the ticket prices to maximize the profit by using function $P(x) = -50(x-12)(x+10)$ where P is the profit and x is the number of $1 price increases. According to this rule, how much should he increase the price in order to maximize the profit, and what will the maximum profit be?**