Basic Word Problems Factored Form

1. Amir stands on a balcony and throws a ball to his dog, who is at ground level. The ball's height (in meters above the ground), x seconds after Amir threw it, is modeled by $\boldsymbol{h(x) = -(x+1)(x-7)}$ **What is the maximum height that the ball will reach? How many seconds after being thrown will the ball reach its maximum height?**

2. Ana dives into a pool from a springboard high dive. Her height (in meters above the water), x seconds after diving, is modeled by $h(x) = -5(x+1)(x-3)$**What is the height of Ana above the water at the start of the dive? How many seconds after starting her dive will Ana hit the water?**

3. Guillermo is a professional deep water free diver. His altitude (in meters relative to sea level), x seconds after diving, is modeled by $\boldsymbol{g(x) = \frac{1}{20}\, x(x-100)}$ **What is the lowest altitude Guillermo will reach?**

4. A certain company's main source of income is a mobile app. The company's annual profit (in millions of dollars) as a function of the app's price (in dollars) is modeled by $\boldsymbol{P(x) = -2(x-3)(x-11)}$ **What would be the company's profit if the price of the app is** 0 **dollars?**

5. An object is launched from a platform. Its height (in meters), x seconds after the launch, is modeled by $\boldsymbol{h(x) = -5(x+1)(x-9)}$ **How many seconds after launch will the object hit the ground?**

6. A hovercraft takes off from a platform. Its height (in meters), x seconds after takeoff, is modeled by $\boldsymbol{h(x) = -(x-11)(x+3)}$ **What is the height of the hovercraft at the time of takeoff?**

7. The power generated by an electrical circuit (in watts) as a function of its current c (in amperes) is modeled by $\boldsymbol{P(c) = -15c(c-8)}$ **What current will produce the maximum power?**

8. **Determine a QUADRATIC *equation* that has -7 and 9 as solutions?** ANS: there is more than one correct answer…come check with me.

9. **N**ow go back to every question and think about OTHER questions that I COULD have asked. Try to anticipate how the properties of functions can be turned into practical question. Ex. For #2….I COULD ask…During her dive, for how long is Ana DESCENDING?

ANSWERS:

1. 16, 3
2. 15, 3
3. -125
4. -66 (million)…a loss
5. 9
6. 33
7. 4