**2**. [10 points] A movie theater is considering selling discount tickets for opening night of a new vampire movie. The management estimates that they will sell 1100 tickets if they set the price of tickets at \$7 each. However, if they charge \$10 for each ticket, the theater will only sell 800 tickets. Let $T(p)$ be the number of tickets the theater will sell if the price of each ticket is $p$ dollars. Assume that $T(p)$ is a linear function.

**a**. [4 points] Find a formula for $T(p)$ in terms of $p$.

$T(p) =$ _____

**b**. [1 point] Let $R(p)$ be the total amount of money the theater takes in from ticket sales if the price of each ticket is $p$ dollars. Find a formula for $R(p)$ in terms of $p$.

$R(p) =$ _____

**c**. [5 points] By completing the square, put $R(p)$ in vertex form. *Show step by step work.* How much should the theater charge for each ticket if they want to maximize the amount of money they take in? How much would the theater take in if they charged this amount?

**Vertex form:** $R(p) =$ _____

**Ticket price:** _____ **Money taken in:** _____