

5. [13 points] Roo is a boxing kangaroo in Australia. Every Sunday, Roo has a boxing match against a professional boxer at the Sydney Opera House.

Let $r(t)$ be the revenue, in dollars, that the opera house makes from ticket sales when it sells t tickets to one of Roo's matches. Then

$$r(t) = t \left(230 - \frac{1}{30}t \right).$$

Note: The capacity of the Sydney Opera House is 5738, so there are never more than 5738 tickets sold to a match.

- a. [5 points] If the opera house had a revenue of \$159,120 from ticket sales to last week's match, how many tickets did they sell? *Remember to show your work carefully.*

Answer: _____

- b. [6 points] Use the method of completing the square to put the formula for $r(t)$ in vertex form. *Carefully show your algebraic work step-by-step.*

Answer: $r(t) =$ _____

- c. [2 points]

What is the maximum possible revenue? _____

How many tickets are sold to make the maximum possible revenue? _____