7. [10 points] To aid in Elphaba's escape, Walt has concocted a supplement that will make her stronger and more agile. The concentration of the supplement in Elphaba's system, in mg/ml, t minutes after it is administered is given by the following formula:

$$T(t) = \begin{cases} at^3 & 0 \leq t \leq 5 \\ b(t-6)^2 + 10 & 5 < t \leq 7 \end{cases}$$

where a and b are constants.

   a. [7 points] Given that $T(t)$ is differentiable, find a and b. Give your answers in exact form.

Answer: $a =$ _____   and $b =$ _____

   b. [3 points] Using the values of a and b you found in part (a), give a formula for the tangent line to the graph of $y = T(t)$ at $t = 5$.

Answer: $y =$ _____