3. [12 points] Cleaver the beaver is building a large dam to protect against predators. After 4 hours of working, the dam he is building is 24 cm high. After 16 hours of working, the dam he is building is 180 cm high. Let $C(t)$ be the height of Cleaver's beaver dam, in cm, after he has been working for t hours. Assume that $C(t)$ is exponential.

    a. [4 points] Find a formula for $C(t)$. *You must find your answer algebraically. All numbers in your formula should be in exact form.*

Answer: _____

    b. [1 point] Find the continuous hourly growth rate of the height of Cleaver's dam. *Round your answer to the nearest 0.01%.*

Answer: _____

Cleaver's neighbors, Anne and Barry, are also each building a dam, and they start working at the same time. Let $A(t)$ be the height, in cm, of Anne's dam t hours after she starts working on it, and let $B(t)$ be the height, in cm, of Barry's dam t hours after he starts working on it.

    c. [2 points] Write an equation that expresses the following sentence:

    "After they have been working for h hours, Anne's dam is 35% taller than Barry's dam."

    Note: Your equation may involve A, B, and h.

Answer: _____

    • Anne's dam starts off 5 cm high, and she builds at a continuous hourly rate of 22%.

    • Barry's dam starts off 12 cm high, and he builds at a constant rate of 4 cm per hour.

    d. [2 points] Use the information above to find formulas for $A(t)$ and $B(t)$.

Answers: $A(t) =$ _____ and $B(t) =$ _____

    e. [3 points] When will Anne's dam be 35% taller than Barry's dam? *Round your answer to the nearest 0.01 hour. Clearly indicate how you found your solution. (Remember item 7 from the instructions on the front page.)*

Answer: _____