

+2 Rhino Bonus due this Thursday at the start of class. Watch [this video](#) about the coffee makers and then answer these questions.

- (5/12) 1. Give rough estimates of the following. Provide a measurement of unit in the blank. **Show your calculations for credit.**

$$\frac{dV}{dt} \approx \boxed{} \text{ _____}$$

(to 1 decimal place)

For tall cup on the left from $0 \leq t \leq 10$, $\frac{dh}{dt} \approx \boxed{} \text{ _____}$

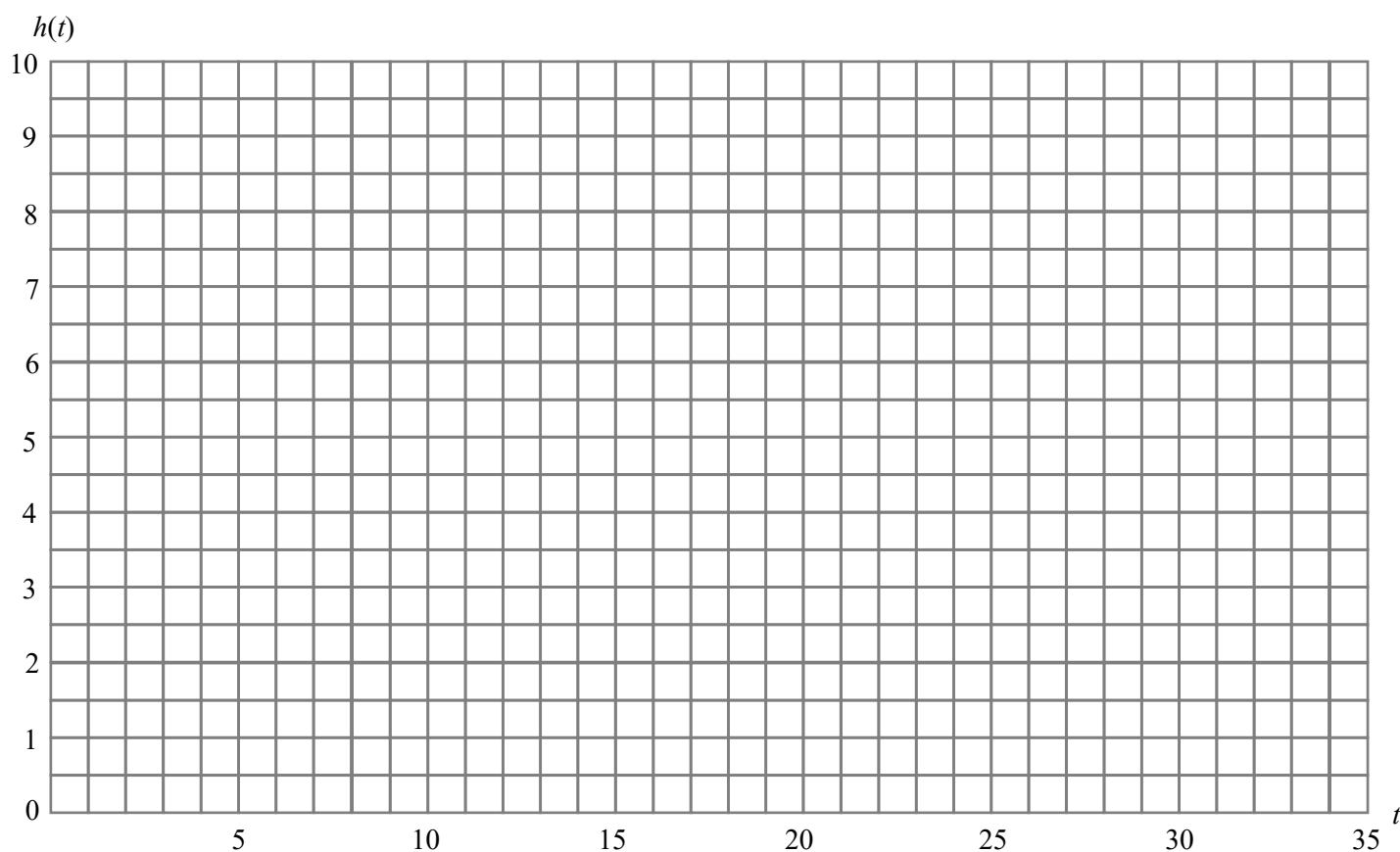
(to 2 decimal places)

For the short classic coffee cup on the right from $0 \leq t \leq 35$, $\frac{dh}{dt} \approx \boxed{} \text{ _____}$

(to 2 decimal places)

Use back if necessary.

- (1/4) 2. On the same set of axes, sketch rough graphs of the height of coffee in the tall cup on the left for $0 \leq t \leq 18$ and the height of coffee in the short classic coffee cup on the right for $0 \leq t \leq 35$, where h is in cm and t is in seconds.



- (1/3) 3. The function $h(t)$ is **concave down** for values of t where $\frac{dh}{dt}$ decreases. In this case, h increases more and more slowly.

The function $h(t)$ is **concave up** for values of t where $\frac{dh}{dt}$ increases. In this case, h increases faster and faster.

The function $h(t)$ has **no concavity** for values of t where $\frac{dh}{dt}$ is constant.

For the tall cup on the left from $0 \leq t \leq 18$, report the values of t for which

$h(t)$ is concave down: _____

$h(t)$ is concave up: _____

$h(t)$ has no concavity: _____