1 : units in parts (a), (c), and (d)

(a) Volume $= \int_0^{10} A(h)\, dh$

$\approx (2 - 0) \cdot A(0) + (5 - 2) \cdot A(2) + (10 - 5) \cdot A(5)$

$= 2 \cdot 50.3 + 3 \cdot 14.4 + 5 \cdot 6.5$

$= 176.3$ cubic feet

$2 : \begin{cases} 1 : \text{left Riemann sum} \\ 1 : \text{approximation} \end{cases}$

(b) The approximation in part (a) is an overestimate because a left Riemann sum is used and A is decreasing.

1 : overestimate with reason

(c) $\int_0^{10} f(h)\, dh = 101.325338$

The volume is 101.325 cubic feet.

$2 : \begin{cases} 1 : \text{integral} \\ 1 : \text{answer} \end{cases}$

(d) Using the model, $V(h) = \int_0^h f(x)\, dx.$

$\left. \dfrac{dV}{dt} \right|_{h=5} = \left[\dfrac{dV}{dh} \cdot \dfrac{dh}{dt} \right]_{h=5}$

$\qquad\quad = \left[f(h) \cdot \dfrac{dh}{dt} \right]_{h=5}$

$\qquad\quad = f(5) \cdot 0.26 = 1.694419$

When $h = 5$, the volume of water is changing at a rate of 1.694 cubic feet per minute.

$3 : \begin{cases} 2 : \dfrac{dV}{dt} \\ 1 : \text{answer} \end{cases}$