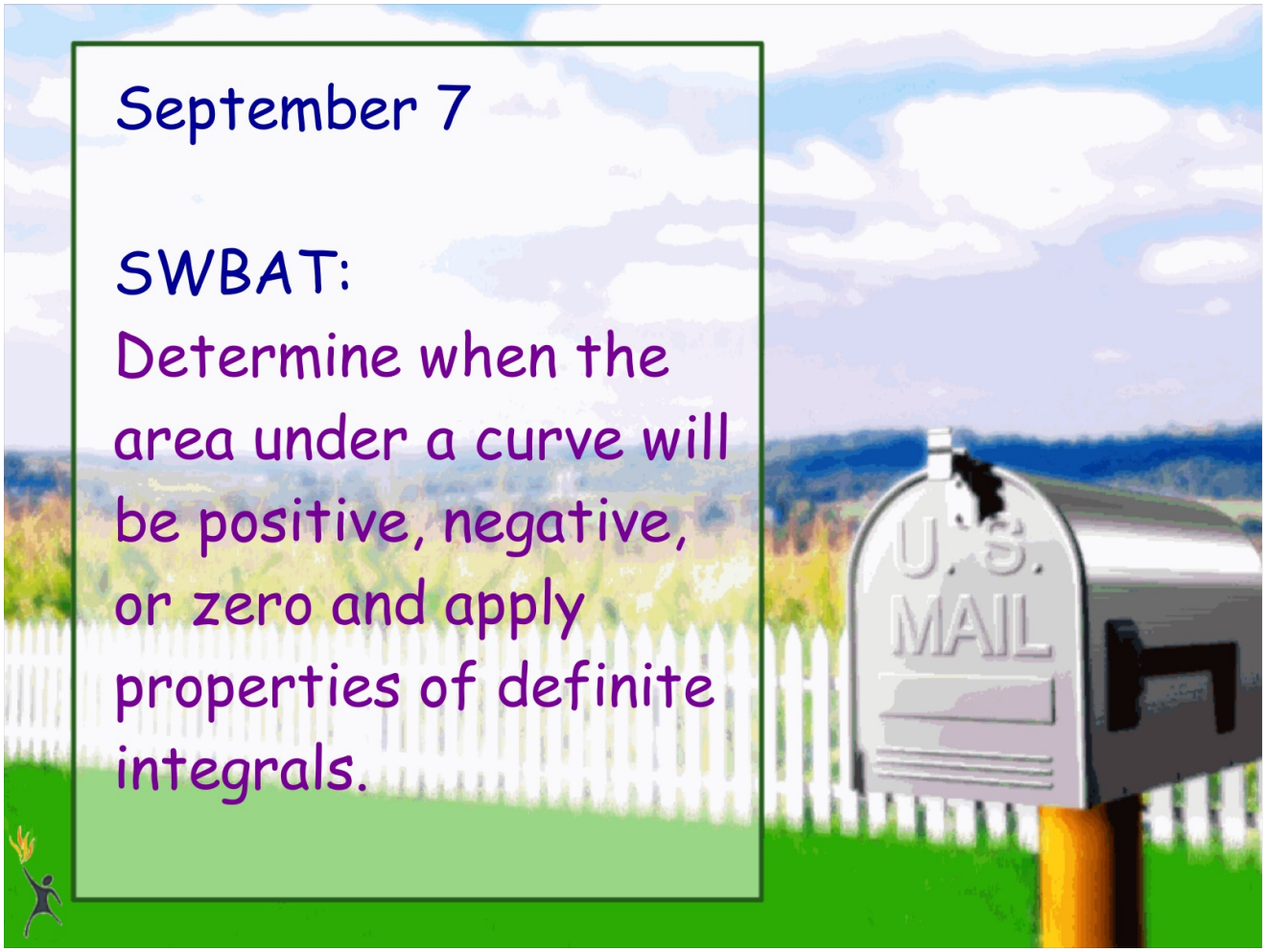

6. Based on your observations on pages 1.2 and 2.2, for any continuous function f on an interval $[c, d]$ and for a and b in $[c, d]$, when will the definite integral $\int_a^b f(x)\,dx$ be positive? Negative? Zero? Clearly explain your generalization.

Positive
$b > a$ & there is more area above the x-axis
$b < a$ & there is more area under the x-axis

Negative
$b < a$ & there is more area above the x-axis
$b > a$ & there is more area below the x-axis

Zero: $b = a$
or the area above = the area below

Order of Integration	$\int_a^b f(x)\,dx = -\int_b^a f(x)\,dx$
Zero	$\int_a^a f(x)\,dx = 0$
Constant Multiple	$\int_a^b k \cdot f(x)\,dx = k\int_a^b f(x)\,dx$ For any number k
Additivity	$\int_a^b f(x)\,dx + \int_b^c f(x)\,dx = \int_a^c f(x)\,dx$
Constant Multiple (special case)	$\int_a^b -f(x)\,dx = -\int_a^b f(x)\,dx \qquad k = -1$
Sum and Difference	$\int_a^b f(x) \pm g(x)\,dx = \int_a^b f(x)\,dx \pm \int_a^b g(x)\,dx$

Quotient Rule

Product Rule