9. [8 points]

Suppose that the standard price of a round-trip plane ticket from Detroit to Paris, purchased t days after April 30, is $P(t)$ dollars. Assume that P is an invertible function (even though this is not always the case in real life).

In the context of this problem, give a practical interpretation for each of the following:

a. [2 points] $P'(2) = 55$

Solution: The standard price of a round-trip ticket from Detroit to Paris is approximately $55 more if the ticket is purchased on May 3 than if it is purchased on May 2.

b. [2 points] $P^{-1}(690)$

Solution: The standard price of a round-trip ticket from Detroit to Paris is $690 if it is purchased $P^{-1}(690)$ days after April 30.

c. [2 points] $\displaystyle\int_5^{10} P'(t)dt$

Solution: The standard price of a round-trip ticket from Detroit to Paris changes by $\displaystyle\int_5^{10} P'(t)dt$ dollars between May 5 and May 10. (If the integral is positive, it will be a price increase. If the integral is negative, it will be a price decrease.)

d. [2 points] $\displaystyle\frac{1}{5}\int_5^{10} P(t)dt$

Solution: This is the average standard price (in dollars) of a round-trip ticket from Detroit to Paris purchased between May 5 and May 10.