Kwantlen Polytechnic University

Mathematics Problem 281:
The winner for problem 281 was James Guerry

If you add one quarter of the time from noon until now to half the time from now until noon tomorrow, you will get the time exactly. What is the time?

Solution provided by James Guerry

Let t be the time, in hours, since noon today. Clearly, $t \in [0, 24]$. Consider three subintervals:

Consider $t \in [0, 1)$:

If t exists on this subinterval, then the current time would be expressed as $t + 12$. Therefore, we would write our equation as follows:

$$\frac{1}{4}t + \frac{1}{2}(24 - t) = t + 12$$

$$t = 0$$

Therefore, the current time could be 12:00pm.

Consider $t \in [1, 13)$:

If t exists on this subinterval, then the current time would be expressed as t. Therefore, we would write our equation as follows:

$$\frac{1}{4}t + \frac{1}{2}(24 - t) = t$$

$$t = 9.6$$

Therefore, the current time could be 9:36pm.

Consider $t \in [13, 24]$:

If t exists on this subinterval, then the current time would be expressed as $t - 12$. Therefore, we would write our equation as follows:

$$\frac{1}{4}t + \frac{1}{2}(24 - t) = t - 12$$

$$t = 19.2$$

Therefore, the current time could be 7:12am.