

## 2023A9

### EMT CALCULATIONS

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**Level 1:** An EMT responds to a medical situation for someone fainting (sudden drop in BP). Upon arrival, the patient is responsive and alert, but visibly shaken up. The EMT proceeds to assess vital signs and records a BP of 115/75 and a breathing rate of 12 breaths per minute.

Using the recorded information, what is the patient's pulse pressure (or the difference between systolic and diastolic pressures)?

To solve this problem, all we need to do is subtract the bottom number from the top number, that is, the diastolic pressure from the systolic pressure.

$$\text{Pulse Pressure} = \text{systolic pressure} - \text{diastolic pressure} = 115 - 75 = \mathbf{40 \text{ mm Hg}}$$

**Level 2:** Tidal volume is the amount of air that enters a person's lungs during normal breathing. This is usually about 500 milliliters.

If a person's breathing rate is 15 breaths per minute, what is the total volume of air (in liters) that will have entered their lungs over the course of an hour?

To solve this problem, we need to calculate how many breaths the person is taking over the course of an hour.

$$15 \text{ breaths per minute} \times 60 \text{ minutes per hour} = 900 \text{ breaths per hour}$$

Then we can multiply the tidal volume by the number of breaths per hour to find the total volume breathed in over the course of an hour. Don't forget to convert to liters!

$$900 \text{ breaths per hour} \times 500 \text{ milliliters per breath} \times \frac{1 \text{ liter}}{1000 \text{ milliliters}} = \mathbf{450 \text{ liters}}$$