

College Algebra, Section 2.4, #52  
Solutions of Linear Inequalities

---

**Temperature** The temperature  $T$  (in degrees Fahrenheit) inside a concert hall  $m$  minutes after a 40-minute power outage during a summer rock concert is given by  $T = 0.43m + 76.8$ . Write and solve an inequality that describes when the temperature in the hall is not more than  $85^\circ\text{F}$ .<sup>1</sup>

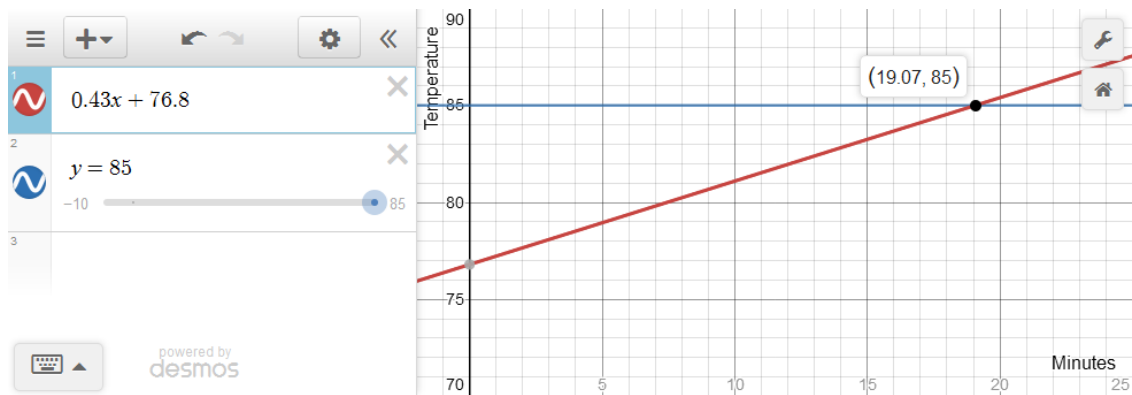
We're given the equation  $T = 0.43m + 76.8$  but we're asked when the temperature in the hall is LESS THAN  $85^\circ\text{F}$  so we actually want to solve  $T \leq 85$ .

Substitute the equation in for  $T$  and solve for  $m$ .

$$\begin{aligned} T &\leq 85 \\ 0.43m + 76.8 &\leq 85 \\ 0.43m &\leq 8.2 \\ m &\leq 19.07 \end{aligned}$$

The temperature in the concert hall is not more than  $85^\circ\text{F}$  for the first 19 minutes after the power goes out.

We have the answer but let's verify it by graphing  $T = 0.43m + 76.8$  and  $T = 85$ .



Here we can see that at 19 minutes the temperature is  $85^\circ\text{F}$  and for less than 19 minutes the temperature is less than  $85^\circ\text{F}$ .

So our algebra was right and the temperature in the concert hall is not more than  $85^\circ\text{F}$  for the first 19 minutes after the power goes out.

---

<sup>1</sup>Harshbarger/Yocco, *College Algebra In Context*, 5e, p. 150, #52.