After graduation, West Point graduates typically have up to 60 days of leave prior to reporting to BOLC. One Sunday evening, a recent grad stated that he was a tenth of the way through his leave. On Thursday evening of the same week, he stated that he was a fifth of the way through his leave. What day of the week will he be half way through his leave? (You must show how you came to this day to receive points)

Solution

Let $x$ represent the current day of leave, and let $y$ represent the total number of days of leave. If Sunday is day $x$, then Thursday is day $x + 4$. Set up the following system of equations.

$$\frac{y}{10} = x$$

$$\frac{y}{5} = x + 4$$

Solve for $x$ and $y$: $x = 4$ and $y = 40$, which means there are 40 total days of leave, and the grad is on day 4 (Sunday) when he is a tenth of the way through his leave. Since there are 40 total days of leave, half way would be 20 day, and since he is on day 4, there are 16 remaining days (2 weeks and 2 days) until the half way point. If day 4 is a Sunday, then day 20 would be **Tuesday**.