Problem 8: Nautical dawn is the time in the morning when the center of the sun is 12 degrees below the horizon. Civil dawn is the time in the morning when the center of the sun is 6 degrees below the horizon. Assuming that one day corresponds to one full rotation, how many minutes pass between nautical dawn and civil dawn.

(Source: Mathcounts 2023 State Sprint Exam)

This is also a conversions problem. We will use the conversion factors $\frac{24 \text{ hours}}{360 \text{ degrees}}$ and $\frac{60 \text{ minutes}}{1 \text{ hour}}$.

$$6 \text{ degrees} \times \frac{24 \text{ hours}}{360 \text{ degrees}} \times \frac{60 \text{ minutes}}{1 \text{ hour}} = 360 \times \frac{24}{360} \text{ minutes} = \boxed{24 \text{ minutes}}$$

Thus $\boxed{24 \text{ minutes}}$ pass between nautical dawn and civil dawn.