$$\log_{5n} 60 = \log_n 5\sqrt{12}$$

$$\log_{25n^2} 3600 = \log_{n^2} 25 \times 12$$

$$\log_{25n^2} 3600 = \log_{n^2} 300$$

$$3600 = (25n^2)^{\log_{n^2} 300} = 25^{\log_{n^2} 300} \times n^{2^{\log_{n^2} 300}} = 25^{\log_{n^2} 300} \times 300$$

$$25^{\log_{n^2} 300} = 12$$

$$\log_{n^2} 300 = \log_{25} 12$$

$$\frac{1}{\log_{300} n^2} = \frac{1}{\log_{12} 25}$$

$$\log_{12} 25 = \log_{300} n^2$$

$$\log_{300} n^2 = 1.29$$

$$n^2 = 15669$$