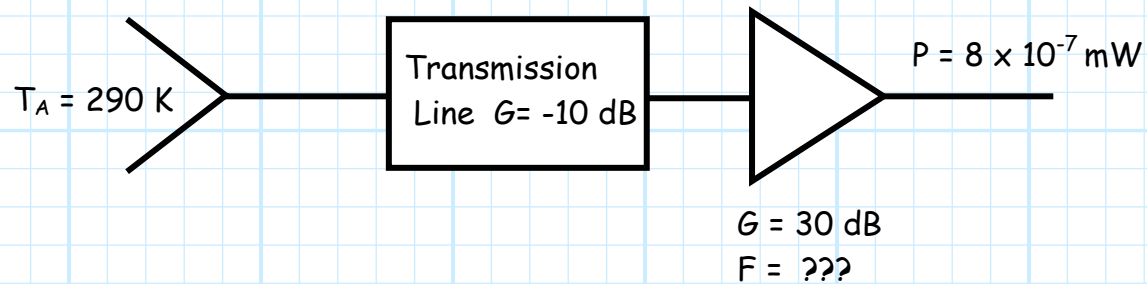


### Special Problem 4.C-4

Consider the three elements below:



The **antenna** has a noise temperature of **290 degrees K**.

The second element is a long length of transmission line that **attenuates** the signal **10 dB**.

The amplifier has a **gain of 30 dB** but has an unknown noise figure.

The **noise power** at the amplifier **output** is  **$8.0 \times 10^{-7} \text{ mW}$** .

The amplifier **bandwidth** is **100 MHz**.

Determine the **noise figure** of the amplifier.