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CPE22S2

Transmission Impairments

30: db = -0.46

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30.) A signal travels from point A to point B. At point A, the signal power is 100 W. At point B, the power is 90 W. What is the attenuation in decibels

Given:
$P_A = 100\,W$; $P_B = 90W$
Required:
Attenuation in dB
Formula:
$dB = 10 \log \left(\frac{P_B}{P_A}\right)$
Computations:
$dB = 10 \log \left(\frac{90}{100}\right)$
$dB = 10 \log (.9)$
$\boxed{dB = -0.46}$

31: Final = Pb = 0.5W

31.) The attenuation of a signal is -10dB. What is the final signal power if it was originally 5W?

Given:
$dB = -10$; $P_A = 5W$
Required:
P_B = Final signal Power
Formula:
$dB = 10 \log \left(\frac{P_B}{P_A}\right)$

Computations:
$\frac{-10}{-10} = \frac{10 \log \left(\frac{P_B}{5}\right)}{-10}$
$-1 = \log \left(\frac{P_B}{5}\right)$
$10^{-1} = \frac{P_B}{5}$
$\frac{5}{10} = P_B$
$\boxed{0.5 = P_B}$

32: Total Gain = 12 dB, Total Signal Amplified = 3

32.) A signal has passed through three cascaded amplifiers, each with a 4dB gain. What is the total gain? How much is the signal amplified?

Given:

Amplifier gain = 4dB

Required:

G = Total Gain ; A = Signal Amplified

Formula:

Total gain = Amp Gain + Amp Gain + Amp Gain

Total Signal Amplified

Computation:

Total Gain = 4dB + 4dB + 4dB = **12dB**

Total Signal Amplification = **3 times**