

1) For the following RADAR system, calculate the maximum range in Km a 3m x 3m target could be detected at 60 pts

I suggest you put this in a spreadsheet or program

I suggest you do your calculations in dB format

**RADAR SYSTEM PARAMETERS**

Peak Power	61.46 dB	W
Antenna Aperture	5 m x 3 m	
Pulsed Signal Frequency	2.8 GHz	
Pulse Width	600 ns	
Pulse Repetition Rate	1200 Hz	
Receiver Noise Bandwidth	61.7 dB	Hz
Effective Noise Temperature	29.5 dB	K
Typical system Losses	8 dB	
Antenna Rotation Rate	12 rpm	
Azimuth Beamwidth	1.3 °	
Antenna beam forming losses	10 db	
S/N / dwell , min for detection	12 db	

## 2) Pipeline

60pts

The 4 stages of a data path have the following latencies

Stage 1: 200ps, Stage 2: 400ps, Stage 3: 300ps, Stage 4: 100ps

Pipelining these stages adds 20% to the latency of each stage

a) Should you create a pipeline or not? (show your work)

b) At what latency penalty (%) does your decision change? (show your work)