1. Using the RADAR distance equation, if a signal returns after 573.3 µsec, how far away is the detected object?

R = ☐

2. During an exercise, a UAS is used to gather information on the red forces. The red team has deployed a mobile RADAR unit and the signal from the RADAR takes 133.3 us to return. How far away is the UAS?

R = ☐

3. A squadron of planes is approaching a RADAR installation. The squadron has the following characteristics:

   $\sigma = 8\text{m}^2$
   $G_R = 3.2$
   $P_{r,\text{min, RWR}} = 400\text{nW}$
   altitude = 3500ft, AGL

   The RADAR installation has the following characteristics:

   $f = 900\text{MHz}$
   $G_T = 250$
   $P_T = 9\text{kW}$
   $P_{r,\text{min,RADAR}} = 15\text{fW}$
   altitude = 175ft, AGL

(a) For the conditions specified, what will be the maximum line of sight distance between the RADAR and the lead aircraft?

$R_{LOS} =$ ____

(b) What is the maximum distance from which the lead aircraft's RWR will detect the RADAR?

$R_{RWR} =$ ____

(c) What is the maximum distance from which the RADAR will detect the planes?

$R_{RADAR} =$ ____

(d) Who will see who first, and at what range? Answer =

4. For the data given in Problem 3, what would be the planes' new altitude so that the line-of-sight distance matches the RWR detection distance?

Altitude = [ ]

5. For the data given in Problem 3, what is the minimum RCS value (σ) required for the RADAR to be able to detect the plane at the original LOS distance?

σ = [ ]

6. The RCS of a fighter is approximately 20 square meters. The RCS of a missile is approximately 0.2 square meters. How many times farther away can the fighter be detected than the missile?

Answer = [ ]

7. During an exercise, a UAS is used to gather information on the red forces. The red team has deployed a mobile RADAR unit, with the following parameters:

RADAR unit	UAS
Frequency = 450 MHz	RCS = 0.4 m^2
Transmit Power = 1.5kW	Receive antenna gain = 3
Antenna gain = 200	Minimum power received = 1.25 μW
Minimum power received = 1 fW	Altitude = 435 ft, AGL

(a) If the RADAR signal takes 133.3 us to return, how far away is the UAS? $R =$

(b) How much power is received by the RADAR if the UAS is 30 km from the RADAR? $P_R =$

(c) For the conditions specified, what will be the maximum line of sight distance between the RADAR and the UAS? $\mathrm{R_{LOS}} =$

(d) What is the maximum distance from which the UAS RWR will detect the RADAR? $R_{RWR} =$ [ ]

(e) What is the maximum distance from which the RADAR will detect the UAS? $R_{RADAR} =$ [ ]

(f) Who will see who first, and at what range? Answer = [ ]