EE 446/646– shade practice

Name: …………………………………….

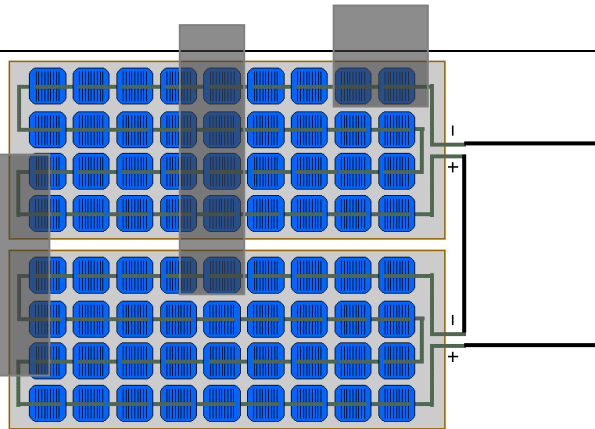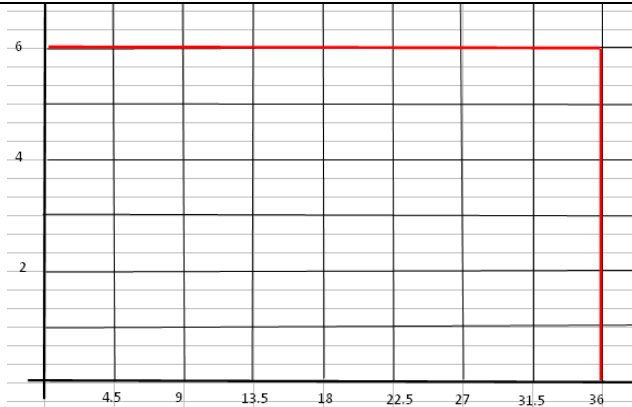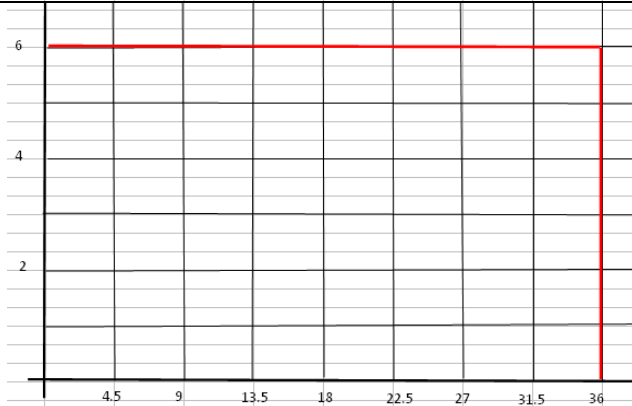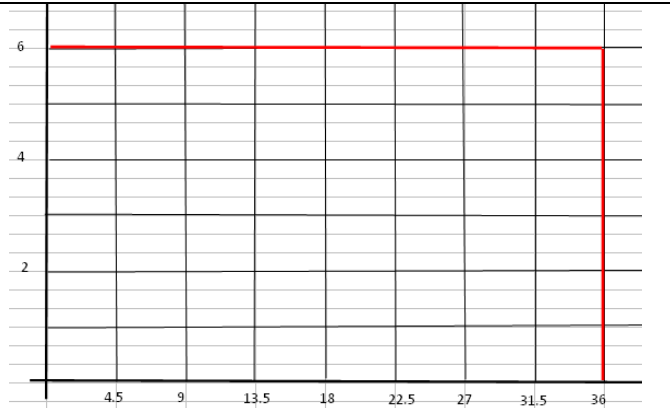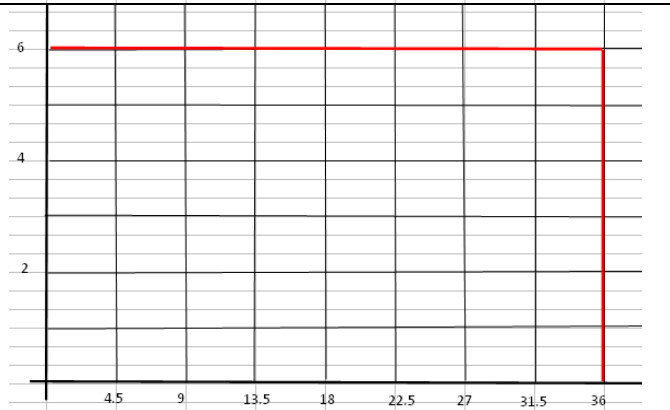|	
Consider 2 PV panels connected in series as shown to the right. The array is operating under 1 sun, and its open circuit voltage and short circuit current are respectively equal to 36 V and 6 A. Assume each panel contains 4 bypass diodes (each diode is placed across 9 cells). For simplicity, further assume the I-V curve of each cell is nearly rectangular in shape (i.e., fill factor ≈ 1), and the forward bias voltage of each bypass diode is 0 V. The figure shows 3 shade geometries: • cells that are not shaded are under 1 sun. • cells that are fully shaded are under 1/3 sun. • cells that is partially shaded are under 2/3 sun.	
1. Plot the approximate I-V Curve of the array if only the left shade is present. **Clearly mark the voltage and current values on the graph.** Then determine the maximum power. P_{max} = ……………W	
2. Repeat 1) if only the middle shade is present.	
3. Repeat 1) if only the right shade is present	
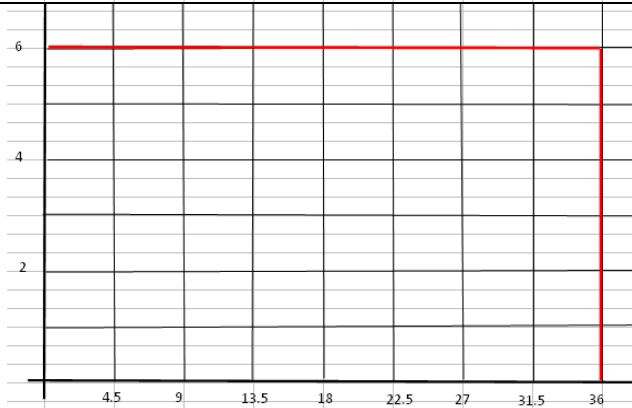
4. Repeat 1) if only the left and middle shades are present.	
5. Repeat 1) if only the left and right shades are present.	
6. Repeat 1) if all the shades are present.	