The Juno Spacecraft Solar Panels

The spacecraft has three rectangular solar panels that each measure 2.7 meters wide by 8.9 meters long. At Earth, the amount of solar energy falling on the panels yields 168 watts per square meter of electrical power.

At Jupiter, which is 5.2 times further from the sun than Earth, the amount of solar energy falling on the panels is 27 times less.

Problem 1 - What is the area of one solar panel?

Problem 2 - What is the total area of all three Juno panels?

Problem 3 - How many watts will the solar panels generate when Juno reaches Jupiter?

Problem 1 - The area of a single panel is

Area = width x length

= 2.7 meters x 8.9 meters

= 24.0 square meters.

Problem 2 - The total combined area of the three panels is 3 x 24 = 72 square meters.

Problem 3 - The electrical power at Earth is then 72 x 168 = 12,096 watts.

At Jupiter it will be 27 times less than this, so

Power at Jupiter = 12,096 watts / 27 = 448 watts.