***For this test, the table represents the carport and the Ready Math books represent the solar panels. The project is located in Talent, OR and will be installed at a 32 degree tilt facing true south. The carport covers 4 parking spaces.***



1. Convert the carport and solar panel dimensions into decimal form.

Carport:

4’ - 11 ¾” = \_\_\_\_\_\_\_\_\_\_\_\_’ 2’- 5 11/16” = \_\_\_\_\_\_\_\_\_\_\_\_’

Solar panel:

10 7/8” = \_\_\_\_\_\_\_\_\_\_\_\_’

8 1/2” = \_\_\_\_\_\_\_\_\_\_\_\_’

2) Arrange the “solar panels” on the “carport” in an array with the long side of the book parallel with the short end of the table. How many total books can you fit onto the table? (None of the books can be hanging over the edge)

3) Arrange the “solar panels” on the “carport” in an array with the short side of the book parallel with the short end of the table. How many total books can you fit onto the table? (None of the books can be hanging over the edge)

4) Which of the two arrangements (1 or 2) is most efficient? Explain how you know.

5) For the most efficient layout label the dimensions of both the carport and solar array (use decimal form).

6) What is the area of the carport?

7) What is the area of the solar array?

8) What percent of the carport does the solar array cover?

9) Use PV Watts to Complete the following table.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  | **Based on \_\_\_\_% coverage** |
| **DC System size** | **20 kW** | **Adjusted DC System Size** |  |
| **kWh output** |  | **Adjusted kWh output** |  |
| **Annual Value** |  | **Adjusted annual value** |  |

10) Complete the table below.

The carport installation cost is $1325 per parking space. In addition, the cost of the carport structure is $6,050. It costs $3 / watt to install the solar array.

|  |  |
| --- | --- |
| Carport installation cost |  |
| Carport structure cost |  |
| Solar installation cost |  |
| Total Installation cost |  |
| Return on Investment |  |

(Return on investment is how many years it will take to recover the the installation costs using the money you save having the solar array (called the annual value)).