L2 Solar Panels practice questions

Name _____ Date _____

Martin is a solar panel engineer.

Each solar panel is the following size:

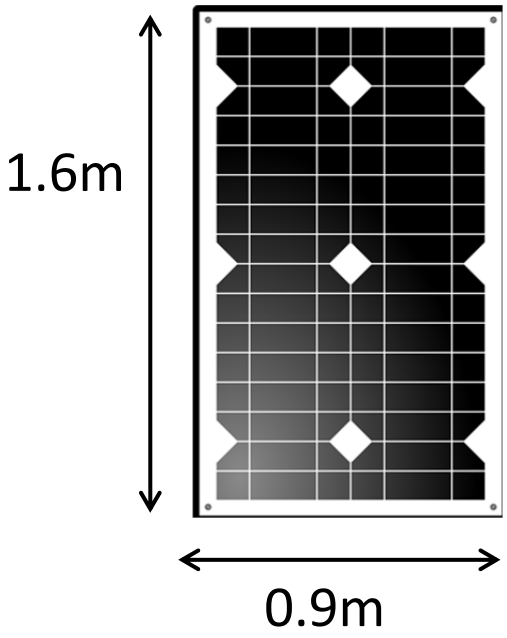
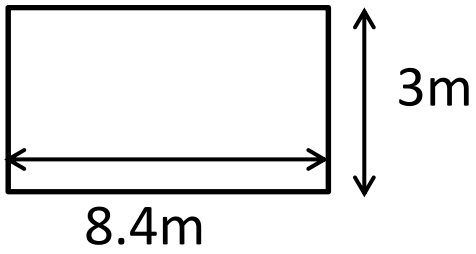


Diagram **not** accurately drawn

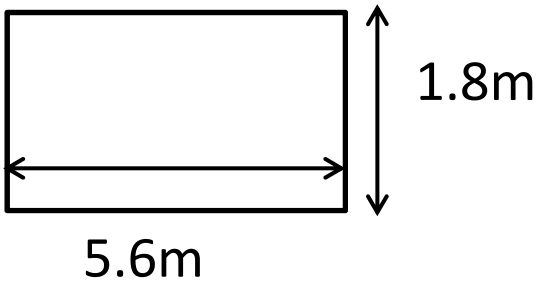
- Panels can be rotated 90°
- All panels must be in the same orientation

Calculate the maximum number of solar panels that Martin can install on these roofs.

1.



2.



Calculate the maximum number of solar panels Martin can install on these roof sections.

3. A rectangular roof section measuring 670cm by 380cm.

4. A rectangular roof section measuring 4590mm by 3780mm.

5. Will is going to get solar panels fitted to a section of the roof of his house.
   The roof section is rectangular 7.2m by 4.4m.
   Each solar panel measures 1400mm by 850mm.
   There needs to be at least a 30cm gap left at each edge of the roof section.
   Will thinks he can have at least 15 solar panels fitted to the roof section.
   Is Will correct? Show why you think this.

L2 Solar Panels practice questions Answers and curriculum mapping

If you rotate the panels …

1. 8.4 ÷ 0.9 = 9.333….
   3 ÷ 1.6 = 1.875
   1 x 9 = 9 panels

   8.4 ÷ 1.6 = 5.25
   3 ÷ 0.9 = 3.333….
   5 x 3 = 15 panels

   Answer = 15 panels

2. 5.6 ÷ 0.9 = 6.222…
   1.8 ÷ 1.6 = 1.125
   6 x 1 = 6 panels

   5.6 ÷ 1.6 = 3.5
   1.8 ÷ 0.9 = 2
   3 x 2 = 6 panels

   Answer = 6 panels

3. 1m = 100cm
   670 ÷ 100 = 6.7m
   380 ÷ 100 = 3.8m

   6.7 ÷ 0.9 = 7.444…
   3.8 ÷ 1.6 = 2.237
   7 x 2 = 14 panels

   6.7 ÷ 1.6 = 4.1875
   3.8 ÷ 0.9 = 4.222…
   4 x 4 = 16 panels

   Answer = 16 panels

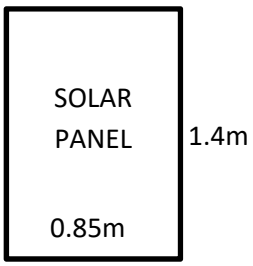
4. 1m = 1000mm
   4590 ÷ 1000 = 4.59m
   3780 ÷ 1000 = 3.78m

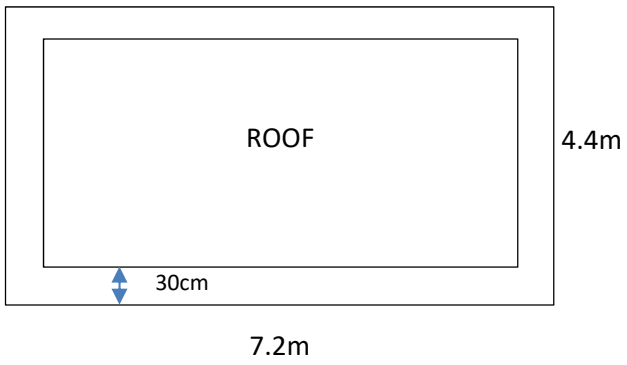
   4.59 ÷ 0.9 = 5.1
   3.78 ÷ 1.6 = 2.3625
   5 x 2 = 10 panels

   4.59 ÷ 1.6 = 2.86…
   3.78 ÷ 0.9 = 4.2
   2 x 4 = 8 panels

   Answer = 10 panels

5. 1m = 1000mm
   1400 ÷ 1000 = 1.4m
   850 ÷ 1000 = 0.85m

   30cm ÷ 100 = 0.3m
   Area of roof available -
   7.2 - 0.3 - 0.3 = 6.6m
   4.4 – 0.3 – 0.3 = 3.8m
   6.6 ÷ 0.85 = 7.7…
   3.8 ÷ 1.4 = 2.7…
   7 x 2 = 14 panels

   If rotated…
   6.6 ÷ 1.4 = 4.7….
   3.8 ÷ 0.85 = 4.4….
   4 x 4 = 16 panels

   Answer – Yes, Will is correct. He can actually fit 16 solar panels to the roof if he rotates each panel.

FUNCTIONAL MATHEMATICS **Coverage and Range statements (indicative only)**

Coverage and range statements provide an indication of the type of mathematical content candidates are expected to apply in functional contexts. Relevant content can also be drawn from equivalent National Curriculum levels and the Adult Numeracy standards. ✓ *indicates the main coverage and range skills covered in this resource, although these may vary with the student group and how the resource is used by the teacher.*

Reference: *Ofqual (2009), Functional Skills criteria for Mathematics: Entry 1, Entry 2, Entry 3, level 1 and level 2. https://www.gov.uk/government/publications/functional-skills-criteria-for-mathematics*

Level 1

a) Understand and use whole numbers and understand negative nos. in practical contexts ✓
b) Add, subtract, multiply and divide whole numbers using a range of strategies ✓
c) Understand and use equivalences between common fractions, decimals and percentages
d) Add and subtract decimals up to 2 decimal places
e) Solve simple problems involving ratio, where one number is a multiple of the other
f) Use simple formulae expressed in words for one- or two-step operations
g) Solve problems requiring calculation, with common measures, including money, time, length, weight, capacity and temperature
h) Convert units of measure in the same system ✓
i) Work out areas and perimeters in practical situations
j) Construct geometric diagrams, models and shapes ✓
k) Extract and interpret information from tables, diagrams, charts and graphs ✓
l) Collect and record discrete data and organise and represent information in different ways
m) Find mean and range
n) Use data to assess the likelihood of an outcome

Level 2

a) understand and use positive and negative numbers of any size in practical contexts
b) carry out calculations with numbers of any size in practical contexts, to a given number of decimal places ✓
c) understand, use and calculate ratio and proportion, including problems involving scale
d) understand and use equivalences between fractions, decimals and percentages
e) understand and use simple formulae and equations involving one or two operations
f) recognise and use 2D representations of 3D objects ✓
g) find area, perimeter and volume of common shapes ✓
h) use, convert and calculate using metric and, where appropriate, imperial measures ✓
i) collect and represent discrete and continuous data, using information and communication technology (ICT) where appropriate
j) use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate.
k) use statistical methods to investigate situations
l) use probability to assess the likelihood of an outcome

This resource also covers many **adult numeracy curriculum** elements. http://www.excellencegateway.org.uk/content/etf1075