MATHEMATICAL SKILLS

AREA OF A RECTANGLE AND ASSOCIATED EXAMINATION QUESTIONS

DESIGN AND TECHNOLOGY

NOT FOR SALE OR REDISTRIBUTION

THIS MATERIAL CANNOT BE EDITED OR PLACED ON ANY OTHER FORM OF MEDIA, INCLUDING POWERPOINTS, INTRANETS, WEBSITES ETC...
**Definition:** A rectangle has four sides, with the opposite sides being the same length and parallel. Each of the four internal angles are right angles, 90 degrees.

**FORMULA**

\[ \text{AREA} = \text{LENGTH} \times \text{HEIGHT} \]

**SAMPLE QUESTIONS**

Calculate the area of the rectangle shown opposite.

\[ \text{AREA} = 100\text{mm} \times 50\text{mm} \]
\[ \text{AREA} = 5000\text{mm}^2 \]

Calculate the area of the rectangle shown opposite.

\[ \text{AREA} = 90\text{mm} \times 60\text{mm} \]
\[ \text{AREA} = 5400\text{mm}^2 \]
Calculate the area of the rectangle shown opposite.

\[
\text{AREA} = X \text{ multiplied by } Y
\]
\[
\text{AREA} = 110\text{mm} \times 70\text{mm}
\]
\[
\text{AREA} = 7700\text{mm}^2
\]

Calculate the area of the rectangle shown opposite.

\[
\text{AREA} = X \text{ multiplied by } Y
\]
\[
\text{AREA} = 120\text{mm} \times 80\text{mm}
\]
\[
\text{AREA} = 9600\text{mm}^2
\]

Calculate the area of the rectangle shown opposite.

\[
\text{AREA} = X \text{ multiplied by } Y
\]
\[
\text{AREA} = 115\text{mm} \times 75\text{mm}
\]
\[
\text{AREA} = 8625\text{mm}^2
\]

Calculate the area of the rectangle shown opposite.

\[
\text{AREA} = X \text{ multiplied by } Y
\]
\[
\text{AREA} = 135\text{mm} \times 85\text{mm}
\]
\[
\text{AREA} = 11475\text{mm}^2
\]
**Definition:** A rectangle has four sides, with the opposite sides being the same length and parallel. Each of the four internal angles are right angles, 90 degrees.

**Formulas:**

\[ \text{Area} = \text{Length} \times \text{Height} \]

**Sample Questions:**

Calculate the area of the rectangle shown opposite.

- \[ 50 \text{mm} \]
- \[ 100 \text{mm} \]

Calculate the area of the rectangle shown opposite.

- \[ 60 \text{mm} \]
- \[ 90 \text{mm} \]
Calculate the area of the rectangle shown opposite.

\[ \text{Area} = \text{length} \times \text{width} \]

- For the rectangle with length 110mm and width 70mm:
  \[ \text{Area} = 110 \times 70 = 7700 \text{ mm}^2 \]

- For the rectangle with length 115mm and width 75mm:
  \[ \text{Area} = 115 \times 75 = 8625 \text{ mm}^2 \]

- For the rectangle with length 120mm and width 80mm:
  \[ \text{Area} = 120 \times 80 = 9600 \text{ mm}^2 \]

- For the rectangle with length 135mm and width 85mm:
  \[ \text{Area} = 135 \times 85 = 11475 \text{ mm}^2 \]
An acrylic panel for a storage unit is seen below.

1. Calculate the area of the acrylic required, before it is cut to shape (the overall rectangle of acrylic required, before it is cut to an L shape).

2. Calculate the area of the final L shape.

First, calculate the area of the uncut acrylic, by treating it as a rectangle 500mm x 400mm.

\[
\text{AREA} = \text{LENGTH} \times \text{HEIGHT} \\
\text{AREA} = 500 \times 400 \\
\text{AREA} = 200000\text{mm}^2
\]

Now, calculate the area of the smaller rectangular piece to be cut away, during the shaping of the panel

\[
\text{AREA} = \text{LENGTH} \times \text{HEIGHT} \\
\text{AREA} = 250 \times 200 \\
\text{AREA} = 50000\text{mm}^2
\]

Now subtract the smaller area from the area of the uncut plywood.

\[200000 - 50000 = 150000\]

\[
\text{AREA OF FINAL SHAPED PIECE IS 150000mm}^2
\]
An acrylic panel for a storage unit is seen below.

1. Calculate the area of the acrylic required, before it is cut to shape (the overall rectangle of acrylic required, before it is cut to an L shape).

2. Calculate the area of the final L shape.
A rectangular acrylic window for an Art project seen below, is composed of two rectangular pieces, accurately cut to size on a laser cutter. They fit perfectly together.

1. Calculate the area of piece A

2. Calculate the area of piece B

First, calculate the entire area of ‘A’, without the smaller piece being removed, by treating it as a rectangle 400mm x 300mm.

\[
\text{AREA} = \text{LENGTH} \times \text{HEIGHT} \\
\text{AREA} = 400 \times 300 \\
\text{AREA} = 120000\text{mm}^2
\]

Now, calculate the area of the smaller rectangular piece ‘B’, *which is also the size of the piece to be removed from ‘A’.*

\[
\text{AREA} = \text{LENGTH} \times \text{HEIGHT} \\
\text{AREA} = 200 \times 150 \\
\text{AREA} = 30000\text{mm}^2
\]

Now subtract the smaller rectangular area ‘B’ from the total area of rectangle ‘A’. The answer will be the area of ‘A’, with the smaller rectangle of waste acrylic being removed.

\[
120000 - 30000 = 90000\text{mm}^2
\]

**AREA OF FINAL SHAPED PIECE ‘A’ WITHOUT THE SMALLER PIECE IS 90000mm²**

**AREA OF PIECE ‘B’ IS 30000mm²**
A rectangular acrylic window for an Art project seen below, is composed of two rectangular pieces, accurately cut to size on a laser cutter. They fit perfectly together.

1. Calculate the area of piece A

2. Calculate the area of piece B