2D→3D? wtf

End of Take-Home Section

Mathematics Methods Perth Modern School

PERTH MODERN SCHOOL
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Mathematics Methods Unit 3 & 4 Investigation 1 2022

Take Home Section

Student name: _____ Teacher name: _____

Task type: **Investigation**

Take Home out: **Monday Week 4, Term 1, 2022**

In class Validation: in usual maths rooms 7:40am

Time allowed for in class task: ___40_____ mins

Materials required: Formula Sheet; Calculators and/or Classpads

Standard items: Pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special items: Drawing instruments, NO NOTES

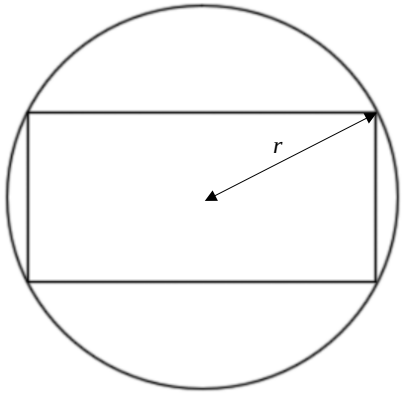
Task weighting: **_10__% in class only**

Formula sheet provided: Yes

Note: All part questions worth more than 2 marks require working to obtain full marks.

Question 1

Use Calculus, investigate the dimension of the largest rectangle that can be inscribed in a circle.



(a) Determine the largest area of the rectangle can be inscribed in a circle of radius $10\,cm$. Justify your answer.

(b) Hence, determine the dimension and the largest area of the rectangle can be inscribed in a circle of radius $r\,cm$.

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Question 2

A window frame is to be built from with a rectangular bottom and a semi-circle top. Given 20 meters of framing materials, determine the dimension of the window to allow the maximum amount of light to be let in.