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**NAME:**

**11AEMAM Test 4 2021**

**Section 1: /**

**Section 2: /**

**Total: /**

**%**

**TIME ALLOCATION FOR THIS TEST**

**Section 1 – No Calculators Allowed**

**minutes reading time: 2 minutes**

**minutes working time: 30 minutes**

**Section 2 – Calculators allowed**

**minutes reading time: 1 minutes**

**minutes working time: 22**

**Material required/recommended for this test**

**To be provided by the supervisor**

Question/answer booklets for Sections One and Two.

SCSA 11AEMAM Formulae Sheet

**To be provided by the candidate**

***Section One:***

Standard items: pens, pencils, pencil sharpener, highlighter, eraser, ruler

*Special materials: drawing instruments, templates, notes on a maximum of one unfolded sheet of A4 paper*

**Section Two:**

Standard items: pens, pencils, pencil sharpener, highlighter, eraser, ruler

*Special materials: drawing instruments, templates, notes on a maximum of one unfolded sheet of A4 paper, notes on a maximum of one unfolded sheet of A4 paper, up to three approved calculators, CAS, graphics, or scientific.*

**Important note to candidates**

No other items may be taken into the test room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the test room. If you have any unauthorised material with you, hand it to the teacher **before** reading any further.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Section** | **Reading Time** | **Working time** | **Marks** | **Score** |
| **Resource free** | **2 minutes** | **30** | **27** | **%** |
| **Resource rich** | **1 minutes** | **20** | **21** | **%** |
| **Total** | **3 minutes** | **50** | **49** | **%** |

**Resource Free: 30 minutes**

Question 1 (6 marks)

(a) On the axes below, sketch the graph of , labelling all key features with their coordinates or equations (3 marks)

Chart

Description automatically generated

(b) Determine the equation of the circle shown below (3 marks)

Chart

Description automatically generated

Question 2 (8 marks)

(a) Solve the equation (4 marks)

(b) The graph of is shown below. Determine the values of the constants of and . (4 marks)

A picture containing sky, antenna

Description automatically generated

Question 3 (8 marks)

(a) If and are acute angles such that and , determine the value of as a single fraction. (4 marks)

(b) Solve the following equations.

(i) where (2 marks)

(ii) where given that (2 marks)

Question 4 (5 marks)

(a) Find the exact value of

**END OF SECTION ONE**

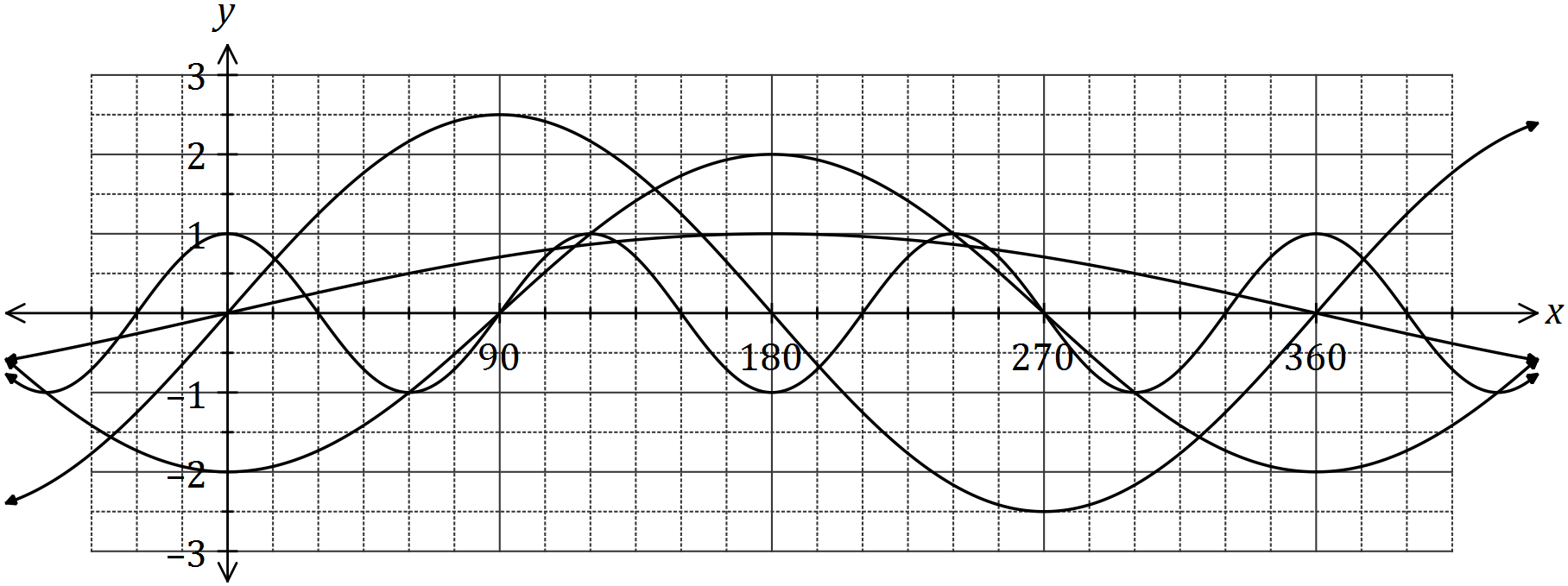
**Calculator Allowed Section** Name: …………………………………

Reading time: 1 minutes

Working time: 20 minutes Marks: 21

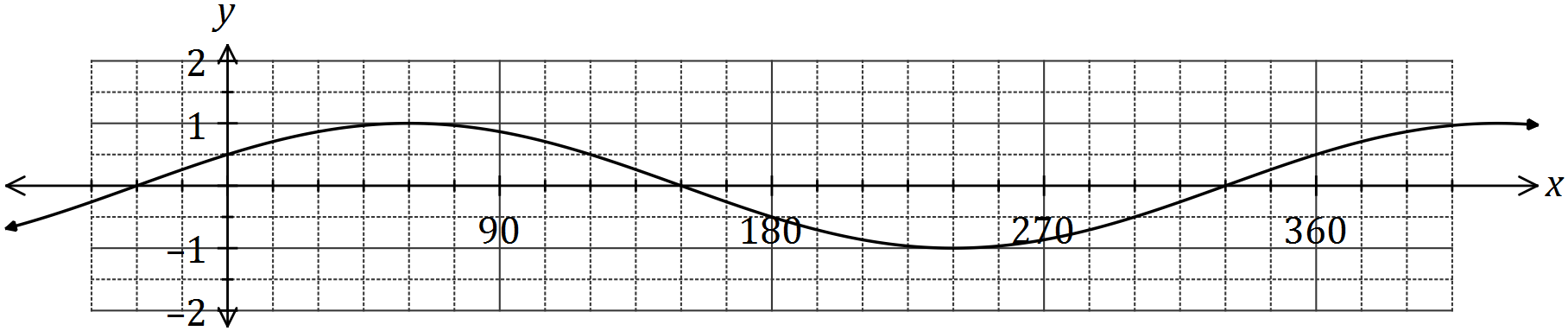
Question 5 (6 marks)

(a) The graphs of and are shown below.



Determine the values of the constants and . (4 marks)

(b) The graph of is drawn below.



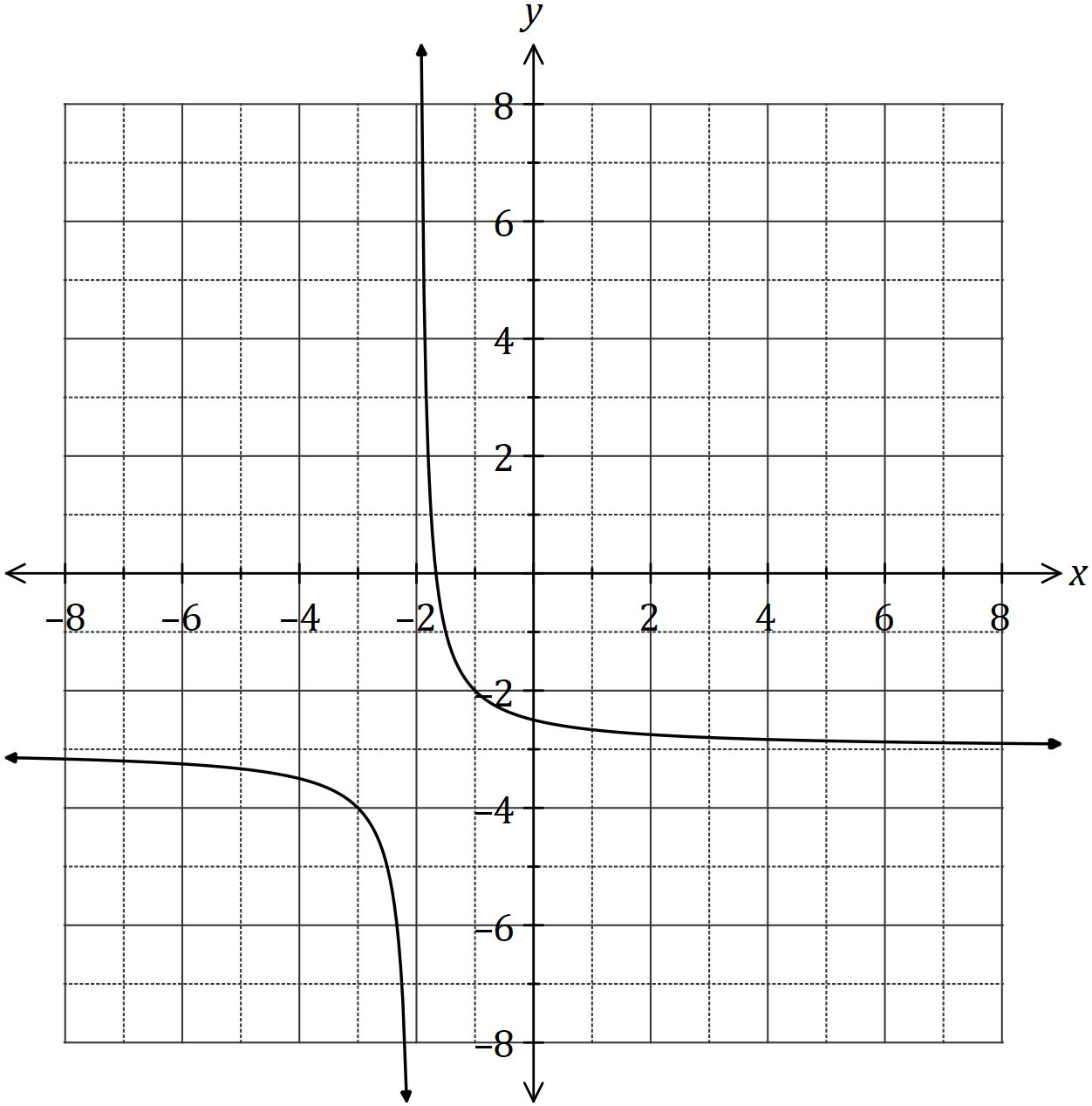
1. State the value of the constant , where . (1 mark)

(ii) The graph is also that of . State the value of the constant , where   
. (1 mark)

Question 6 (7 marks)

Let and , where and are constants.

The graph of is shown below.



(a) Sketch the graph of on the axes above. (3 marks)

(b) Determine the values of and . (2 marks)

(c) Solve the equation , giving your solution(s) to one decimal place. (2 marks)

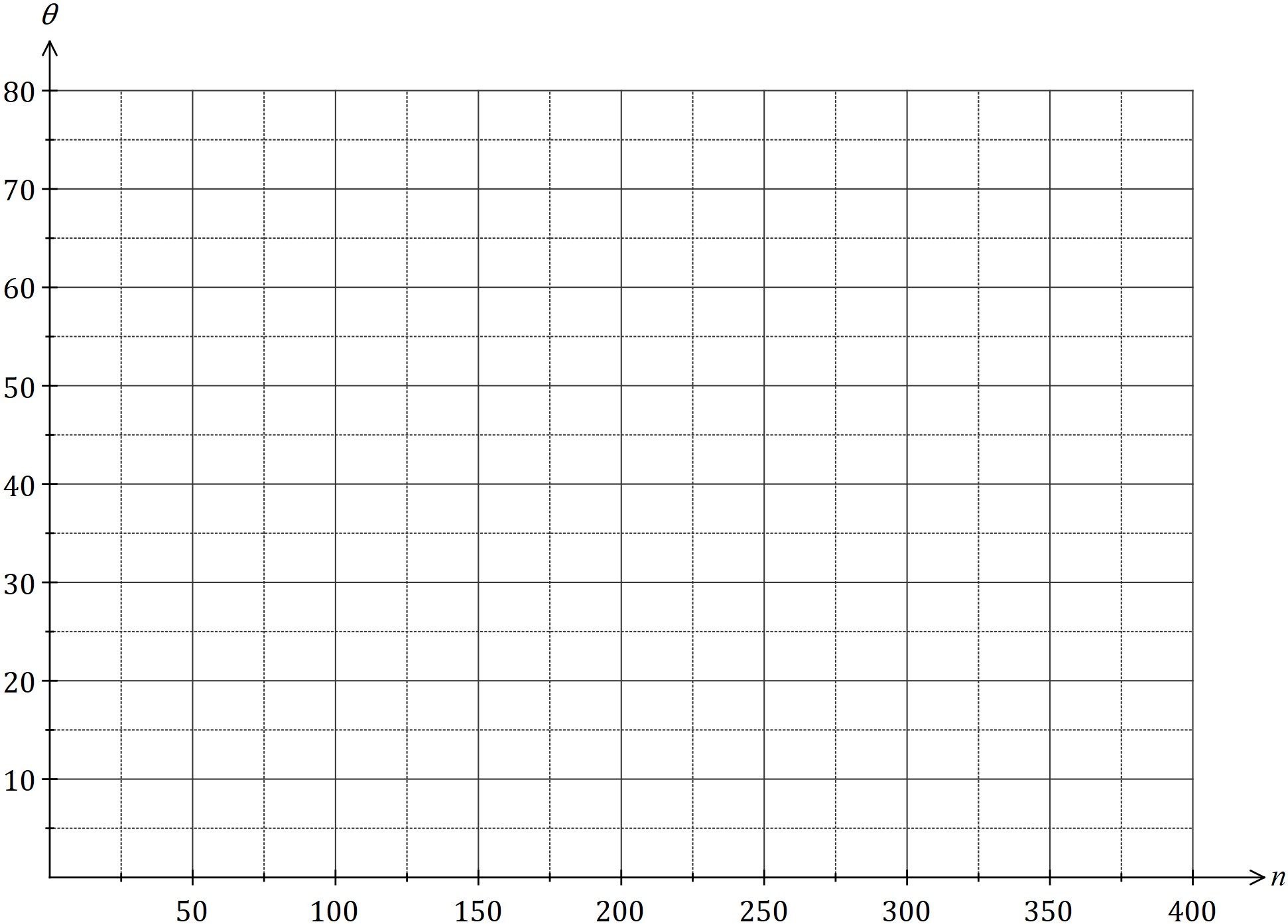
Question 7 (8 marks)

During 2018, the altitude of the sun, degrees, at noon in Melbourne on the day of the year can be modelled by the equation

(a) On the 26th of January, the altitude was . Calculate the altitude ten days earlier.

(2 marks)

(b) Graph the altitude on the axes below for . (4 marks)



(c) State the minimum altitude of the sun at noon in Melbourne and on which day of the year this occurred. (2 marks)

**THIS PAGE HAS BEEN LEFT BLANK INTENTIONALLY TO PROVIDE SPACE FOR WORKING IF REQUIRED**

**END OF TEST**