



Examination Answer Books

12 Pages

Instructions to Candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.

Complete, fold and seal
(see note 2 below)

SURNAME: Malley

FORENAME(S): Charlie

1	Student Number	
2	Title of Examination Paper	TCAA
3	Module Code	PCEE4000
4	Date and Time of Examination	15.01.25 11:15
5	Examination Venue	Pembrokeshire College
6	Seat Number	
7	Number of Answer Books handed in	1

List the numbers of the questions you have attempted	1	2	3	4	5	6	7	8	9	Total
	1	16	12	13	15	14	10	2	8	91

Second Marked
50/100
12/02/25

100

$$\boxed{L = \frac{12\pi f_0^2}{c^2}}$$

X

$$LC = 12\pi f_0^2 \quad (\div C) \quad X$$

$$\sqrt{LC} = 12\pi f_0 \quad (2) \quad X$$

$$2\pi\sqrt{LC} f_0 = 1 \quad (\div 2\pi f_0) \quad \checkmark$$

$$\textcircled{1} \quad f_0 = \frac{1}{2\pi\sqrt{LC}} \quad (\times 2\pi\sqrt{LC})$$

①

das

9

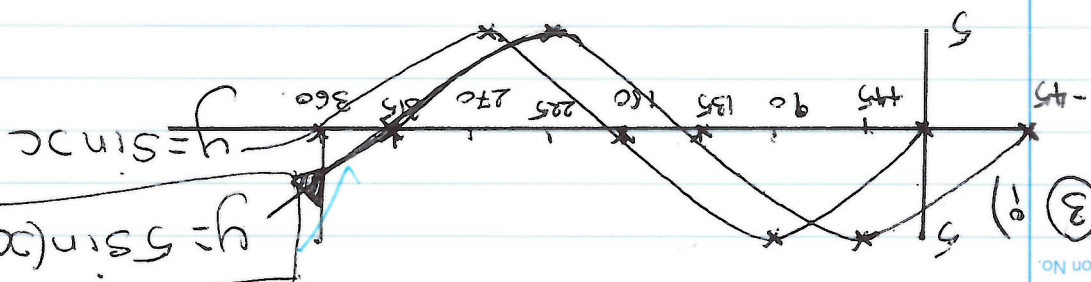
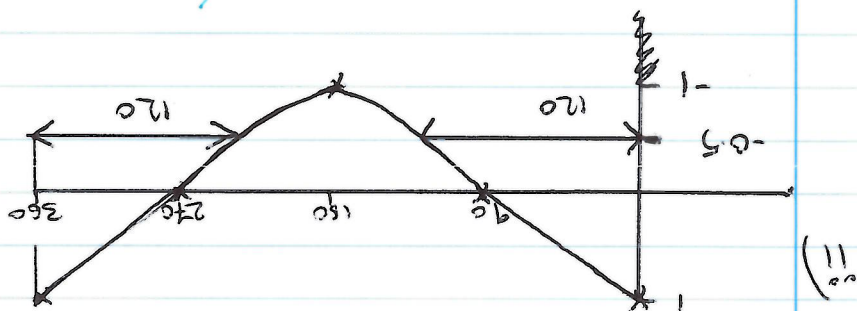
$$OC = 60^\circ, 120^\circ, 240^\circ, 300^\circ$$

$$120^\circ, 240^\circ, 120^\circ + 360^\circ, 240^\circ + 360^\circ = 2x$$

$$120^\circ, 240^\circ, 480^\circ, 600^\circ = 2x$$

$$360^\circ - 120^\circ = 240^\circ$$

$$\cos 20^\circ = \cos^{-1}(-0.5) = 120^\circ$$



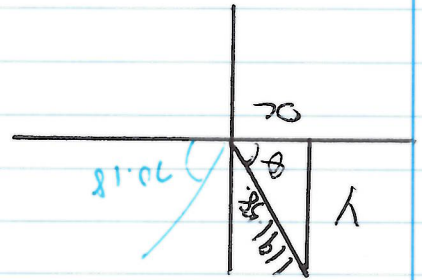
$$y = 5 \sin(x + 45^\circ)$$

$$y = 5 \sin x$$

5DP

6

$$-404.02 + 1120.99j$$

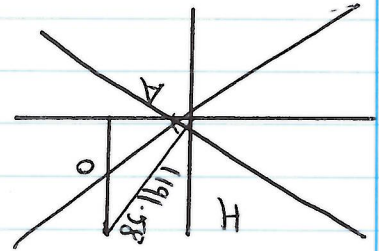


$$\text{Real } Y = \sin(70.18^\circ) \times 1191.58$$

$$Y = 1120.99$$

$$\text{Real } X = \cos(70.18^\circ) \times 1191.58$$

$$X = 404.02$$



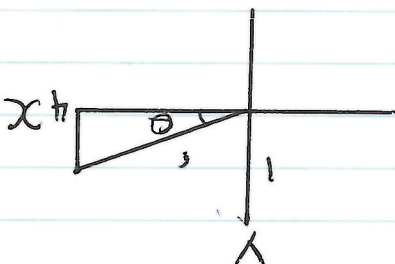
$$1191.58 \angle 70.18^\circ$$

$$(\sqrt{17})^5 \angle 14.036^\circ$$

$$\theta = \tan^{-1}\left(\frac{1}{4}\right) = 14.036^\circ$$

$$r = \sqrt{4^2 + 1^2} = \sqrt{17}$$

$$(4 + j)^5 = (\sqrt{17})^5 \angle 70.18^\circ$$



d/45

5

$$\begin{pmatrix} \frac{1}{9} & \frac{2}{9} \\ \frac{2}{9} & -\frac{1}{18} \end{pmatrix}$$

$$= \begin{pmatrix} \frac{4}{18} & \frac{2}{18} \\ \frac{4}{18} & -\frac{1}{18} \end{pmatrix}$$

$$14) \begin{pmatrix} 4 & 1 \\ -2 & 4 \end{pmatrix}$$

$$\det A = 4 \times 4 - 1 \times -2 = 18$$

400

4

$$y = -2x + 6$$

$$y = mx + c$$

$$2 = -2(2) + c$$

$$2 = -4 + c$$

$$c = 6$$

$$m = -2$$

$$(2, 2)$$

6

$$y = \frac{1}{2}x - 2$$

$$-1 = 1 + c$$

$$c = -2$$

$$y = mx + c$$

$$-1 = \frac{1}{2}(2) + c$$

$$m = \frac{1}{2}$$

$$m = \frac{y - y_1}{x - x_1}$$

$$m = \frac{-1 - (-2)}{2 - 0}$$

$$m = \frac{-1 + 2}{2}$$

$$m = \frac{1}{2}$$

501

8

Speed 1 = 10 rev/min
 Speed 2 = 31 rev/min
 Speed 3 = 97 rev/min
 Speed 4 = 300 rev/min

when $n=3$ $10 \times \sqrt[3]{30} \cdot 3^{-1} = 97 \text{ rev/min}$

when $n=2$ $10 \times \sqrt[3]{30} \cdot 2^{-1} = 31 \text{ rev/min}$

$r = \sqrt[3]{30}$

$r^3 = 30$

when $a=10$ $10r^{4-1} = 300$

$a = 10$

(g) ar^{n-1}