

97/100

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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.
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1	Student Number	2030806
2	Title of Examination Paper	maths. exam
3	Module Code	
4	Date and Time of Examination	23/03/22 10.45
5	Examination Venue	FF003
6	Seat Number	
7	Number of Answer Books handed in	1

[illegible]

Q1.

$$(i) \quad \frac{4a^3 - 6a^2 - 12a}{2a} = 2a^2 - 3a - 6.$$

6

2/2

$$(ii) \quad \frac{36m^3n^3 + 15m^4n^2 + 3m^5n}{3m^5n}.$$

$$3 \quad \frac{12m^3n^3 + 5m^4n^2 + m^5n}{m^5n}.$$

$$\equiv 12m^{-1} + m^{-1} + n.$$

6

$$(iii) \quad \begin{array}{r} 2x + 5 \overline{) 6x^2 + 19x + 10} \\ \underline{6x^2 - 15x + 10} \\ 4x + 0 \\ \underline{4x + 10} \\ 0 \end{array} \quad = 3x + 2.$$

6

$$(iv) \quad \frac{6p^2q^3r}{3p^3q^3r^{-2}} = 2p^{-1}1^{-2}.$$

$$= 2p^{-1}1^{-2}$$

4

$$(v) \quad \frac{2fg}{16h} \times \frac{4gh^2}{4fh} \times \frac{32fh^3}{12f^3}$$

0

$$(i) (2x-1)(3x+5) = (6x-5)(x-9)$$

$$\begin{aligned} 6x-5 &= 6x-45 \\ 6x^2 + 10x - 3x - 5 &= 6x^2 - 54x + 45 \end{aligned}$$

$$6x^2 - 6x^2 \quad 10x - 54x \quad 5x$$

$$7x - 5 = -5x + 45$$

$$7x + 5x$$

$$12x = 45 + 5$$

$$12x = 50$$

$$6x^2 + 10x - 3x - 5 = 6x^2 - 54x - 5x + 45$$

$$7x - 5 = -59x + 45$$

$$-7x - 59x = 45 + 5$$

$$-52x = \frac{50}{52}$$

$$x = \frac{50}{52} \text{ or } 0.96$$

7

$$(ii) \frac{x-4}{5} = \frac{2x-1}{3}$$

$$3(x-4) = 5(2x-1) \Rightarrow 3x-12 = 10x-5$$

$$3x-10x = -7x \quad -5+12 = 7$$

$$-7x = 7$$

$$x = -1$$

7

$$\textcircled{i} \quad 4 - q^2 = \cancel{2}(-q)(2+q) \quad \textcircled{5}$$

$$\begin{aligned} \textcircled{ii} \quad & 3ab + 4cd - cb - 12ad \\ & \cancel{3a} (3ab - cb) - (4cd - 12ad) \\ & = 3b(a - c) - 4d(c - 3a) \end{aligned} \quad \textcircled{5}$$

$$\begin{aligned} \textcircled{iii} \quad & q^2 - 4qr \\ & = q(q - 4r) \end{aligned} \quad \textcircled{5}$$

$$\begin{array}{r} 29 \\ \hline 30 \end{array} \quad \textcircled{}$$

$$\begin{aligned} 2x + 4y &= 16 \\ 3x + 2y &= 7. \end{aligned}$$

$$\frac{16 - 4y}{2}.$$

$$3\left(\frac{16 - 4y}{2}\right) + 2y = 7.$$

$$48 - 12y + 4y = 14. - 48$$

$$\begin{aligned} -8y &= -34. \\ \underline{-8} &\quad \underline{-8} \end{aligned}$$

$$y = 4.25.$$

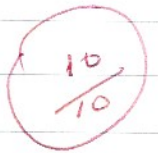
$$2x + 4(4.25) = 16. - 17 = -1.$$

17

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

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

$$x = -\frac{1}{2} \quad y = 4.25 \text{ or } \frac{17}{4}.$$



④

A

$$\begin{bmatrix} + & - & + \\ 1 & 1 & 6 \\ 1 & 2 & 1 \\ 1 & 3 & -1 \end{bmatrix}$$

$$1 \begin{vmatrix} -2 & -3 \\ -1 & -1 \end{vmatrix} - 1 \begin{vmatrix} -1 & -1 \\ 6 & 3-2 \end{vmatrix} + 6 \begin{vmatrix} -1 & -1 \\ 1 & 2 \end{vmatrix}$$

$$-5 - 2 + 6$$

determinate = 3

$$A^T \begin{bmatrix} + & - & + \\ 1 & 1 & 1 \\ 1 & 2 & 3 \\ 6 & 1 & -1 \end{bmatrix}$$

$$A^{11} - 2 - 3 = -5 \quad A^{12} - 1 - 18 = -19 \quad A^{13} = 1 - 12 = -11$$

$$A^{21} - 1 \cdot 1 = -2 \quad A^{22} - 1 - 6 = -7 \quad A^{23} 1 - 6 = -5$$

$$A^{31} 3 - 2 = 1 \quad A^{32} 3 - 1 = 2 \quad A^{33} 2 - 1 = 1$$

$$\begin{bmatrix} + & - & + \\ - & + & - \\ + & - & + \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} -\frac{5}{3} & \frac{19}{3} & -\frac{11}{3} \\ \frac{2}{3} & -\frac{7}{3} & \frac{6}{3} \\ \frac{1}{3} & -\frac{2}{3} & \frac{1}{3} \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} -\frac{5}{3} & \frac{19}{3} & -\frac{11}{3} \\ \frac{2}{3} & -\frac{7}{3} & \frac{6}{3} \\ \frac{1}{3} & -\frac{2}{3} & \frac{1}{3} \end{bmatrix}$$

$$\frac{2}{10}$$

$$\textcircled{5} \quad \frac{x+7}{(x-2)(x+1)} = \frac{A}{x-2} + \frac{B}{x+1}$$

$$A(x+1) + B(x-2)$$

$$2+7=9$$

$$\frac{9}{3} = \frac{3A}{3}$$

$$A=3$$

$$-1+7=6$$

$$\frac{6}{-3} = -3b$$

$$B=-2$$

$$\frac{9}{10}$$

$$= -\frac{\cancel{3}A}{x-2} - \frac{\cancel{2}B}{x+1} = \frac{3}{x-2} - \frac{2}{x+1}$$

⑥ $x^2 + 11x + 30 = 0$

~~$x(x^2 + 5x)(5x + 30)$~~

~~$(x + 5) + 6$~~

$$x(x^2 + 5x)(6x + 30)$$

$$(x + 5)(x + 5)$$

⑦ $x = -5 \quad x = -6$

⑧

⑧ $x^2 - 11x = 0$

~~$x = 5$~~ ~~$x = 6$~~ $x = 6 \quad x = 5$

⑨

~~x~~ ⑨ $x^2 - 4 = 0$

$x = +2$

⑩

⑪