

CHRISTOPHER BELTON (2021887) ACDA4008

MATHEMATICS RESIT EXAM

Q1
i
$$\frac{4a^3 - 6a^2 - 12a}{2a}$$

$$2a \overline{) 4a^3 - 6a^2 - 12a}$$

$4a^3$

ii
~~Q2~~
$$\frac{57x^3 y^3 + 15z^4 y^2 + 3x^5 z}{3x^5 y}$$

~~3x⁵y~~
$$\overline{) 57x^3 y^3 + 15z^4 y^2 + 3x^5 z}$$

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$$\text{iii} \quad \frac{6x^2 + 19x + 10}{x+5}$$

$$x+5 \overline{) 6x^2 + 19x + 10}$$

$$\text{iv} \quad \frac{6p^2q^3r}{3r^3q^3r^{-2}}$$

$$\cancel{3p^3q^3r^{-2}} \overline{) 6p^3q^3r^{-2}}$$

$$V \frac{25g}{16h} \times \frac{49h^2}{45h} \times \frac{325h^3}{125^3}$$

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Q2 a

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

$$6x-5 = 6x-414$$

$$6x-5 = 6x$$

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

~~$\frac{3(x-4)}{12} = \frac{-2(2x-1)}{6}$~~

~~$\frac{3x-12}{12} = \frac{-4x+2}{6}$~~

$3x-12$

$2x-1$

Q2b)

i $49 - q^2$
 $-q^2 + 4$

ii $3ab + 4cd - ch - 12ad$

iii $9q^2 - 8qr$

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Q3

$$2x + 4y = 16 \quad (1)$$

$$3x + 2y = 7 \quad (2)$$

$$4x + 8y = 32 \quad (1) \times 2$$

$$- 12x + 8y = 28 \quad (2) \times 4$$

$$= 8x = -4$$

$$\frac{-4}{8x} = -0.5$$

$$x = 0.5$$

$$2(0.5) + 4y = 16$$

$$-1 + 4y = 16$$

$$4y = 16 - 1$$

$$4y = 15$$

$$\frac{15}{4} = 3.75$$

$$y = 3.75$$

$$2 \times 0.5 + 4 \times 3.75 =$$

$$16$$

$$4.25$$

$$3(0.5) + 2y = 7$$

$$1.5 + 2y = 7$$

$$2y = 7 - 1.5$$

Q4 A^{-1}

$$A = \begin{bmatrix} 1 & -1 & 3 \\ -1 & 2 & -2 \\ 1 & -0 & +1 \end{bmatrix}$$

$$A^{-1} = \frac{A^{-1} A}{|A|}$$

$$\begin{matrix} m_{11} & m_{12} & m_{13} \\ m_{21} & m_{22} & m_{23} \\ m_{31} & m_{32} & m_{33} \end{matrix}$$

$$\text{DET} = -5$$

~~$$|A| = \begin{vmatrix} 1 & -1 & 3 \\ -1 & 2 & -2 \\ 1 & 0 & 1 \end{vmatrix} = 1(2-0) - 1(-1-2) + 3(-1-2)$$~~

~~$$= 1(2-0) - 1(-1-2) + 3(-1-2)$$~~

$$|A| = \begin{vmatrix} 1 & -1 & 3 \\ -1 & 2 & -2 \\ 1 & 0 & 1 \end{vmatrix} = 1(2-0) - 1(-1-2) + 3(-1-2)$$

$$= 1(2-0) - 1(-1-2) + 3(-1-2)$$

$$\text{DET} = -5$$

TRANSPOSITION

$$\begin{bmatrix} 1 & -1 & 1 \\ -1 & 2 & 0 \\ 3 & -2 & 1 \end{bmatrix}$$

Q5 $A \times B$

$$A = \begin{pmatrix} 1 & 1 & 3 \\ 1 & 2 & 2 \\ 1 & 0 & -1 \end{pmatrix}$$

$$B = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 0 & 6 \\ 1 & 3 & -1 \end{pmatrix}$$

$$A \times B = \begin{pmatrix} 8 & 11 & 6 \\ 11 & 8 & 13 \\ 0 & -1 & 4 \end{pmatrix}$$

Q6

$$\frac{x+7}{(x-2)(x-1)}$$

$$\frac{A}{x-2} \quad \swarrow \quad \searrow \quad \frac{B}{x-1}$$

~~$$x+7 = A(x-2) + B(x-1)$$~~

$$= \frac{A(x-1) + B(x-2)}{(x-2)(x-1)}$$

$$x+7 = A(x-1) + B(x-2)$$

$$\text{let } x = +1$$

$$1+7 = A(-1-1) + B(-1-2)$$

$$8 = -2A + B$$

$$\frac{8}{-2} \quad A = -4$$

$$\text{let } x = +2 \quad 2+7 = A(+2-1) + B(+2-2)$$

$$9 = A(1) + B(0)$$

$$\underline{9} = 9$$