

17/01/2022

UNEB 2022 MTC PAPER 1

(1) $3(4d-1) - (3d-2) = \frac{5}{9}d$

$$12d - 3 - 3d + 2 = \frac{5}{9}d$$

$$9d + 3 = \frac{5}{9}d$$

$$9d - \frac{5}{9}d = -3$$

$$9 \times \frac{76d}{9} = -3 \times 9$$

$$76d = \frac{-27}{76}$$

$$d = \frac{-27}{76}$$

(2) Let $A = \begin{pmatrix} -6 & 7 \\ 1 & 2 \end{pmatrix}$

$$\det A = (-6 \times 2) - (1 \times 7)$$

$$= -12 - 7$$

$$= -19$$

$$\text{Adj} A = \begin{pmatrix} 2 & -7 \\ -1 & -6 \end{pmatrix}$$

$$A^{-1} = \frac{1}{\det A} (\text{Adj} A)$$

$$= \frac{1}{-19} \begin{pmatrix} 2 & -7 \\ -1 & -6 \end{pmatrix}$$

$$= \frac{1}{-19} \begin{pmatrix} 2 \times -19 & -7 \times -19 \\ -1 \times -19 & -6 \times -19 \end{pmatrix}$$

$$= \begin{pmatrix} -2 & 7 \\ 1 & 6 \end{pmatrix}$$

(3) let the son's age be x

Item	Son	Father	Daughter
Age	x	$2x$	$\frac{2x}{5}$

Total age

$$x + 2x + \frac{2x}{5}$$

$$\frac{3x + 2x}{5}$$

$$\frac{5x + 2x}{5}$$

$$5$$

$$17x$$

$$\frac{17x}{5}$$

(4) $\frac{12m^2 - 27}{2m + 3}$

$$2m + 3$$

$$3(4m^2 - 9)$$

$$2m + 3$$

$$3((2m)^2 - 3^2)$$

$$2m + 3$$

$$3(2m+3)(2m-3)$$

$$(2m+3)$$

$$3(2m-3)$$

⑤

i) Number of sides of polygon
 $= \frac{360^\circ}{24^\circ}$
 $= 15 \text{ sides}$

ii) Angle sum of the polygon
 $= 180^\circ (n-2)$
 $= 180^\circ (15-2)$
 $= 180^\circ \times 13$
 $= 2340^\circ$

⑥

~~$\begin{pmatrix} 5 \\ 7 \end{pmatrix}$~~

$\vec{I} = \vec{T} + \vec{O}$

$\begin{pmatrix} 5 \\ 7 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix} + \begin{pmatrix} -2 \\ 3 \end{pmatrix}$

$\begin{pmatrix} 5 \\ 7 \end{pmatrix} - \begin{pmatrix} -2 \\ 3 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix}$

$\begin{pmatrix} 7 \\ 10 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix}$

Translation vector $= \begin{pmatrix} 7 \\ 10 \end{pmatrix}$

⑦

X	f	d = X - A	fd
43	1	-7	-7
46	1	-4	-4
55	1	5	5
56	1	6	6
58	1	8	8
60	1	10	10
$\Sigma f = 6$			$\Sigma fd = 18$

$M = A + \frac{\Sigma fd}{\Sigma f}$
 $= 50 + \frac{18}{6}$
 $= 50 + 3$
 $= 53 \text{ cm}$

⑧

$x \times \frac{1}{2} (x-2) > 16 + x^2$

$(x-2) > 12 + 2x$

$x-2 > 12 + 2x$

$-2-12 > 2x-x$

$-14 > x$

$x < -14$

⑨

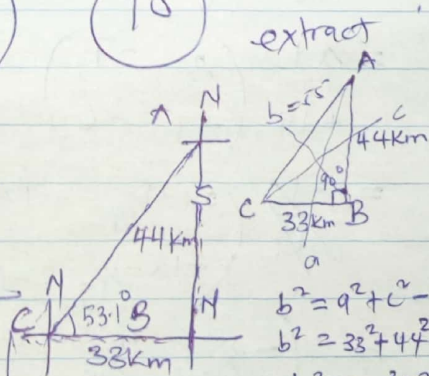
9) Obtained Grade T
 $\frac{10^\circ}{360^\circ} \times 180^\circ$

5 Students

b) $\frac{72^\circ}{360^\circ} \times 100\%$

$= 20\%$

⑩



$b^2 = a^2 + c^2 - 2ac \cos B$
 $b^2 = 33^2 + 44^2 - 2 \times 33 \times 44 \cos 70^\circ$
 $b^2 = 3025$
 $b = 55 \text{ km}$

$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$
 $= \frac{33^2 + 55^2 - 44^2}{2 \times 33 \times 55}$
 $= \frac{3}{5}$

$\angle C = \cos^{-1}(\frac{3}{5})$
 $= 53.1^\circ$

Bearing of A from C
 $\neq 90^\circ - 53.1^\circ = 36.9^\circ$