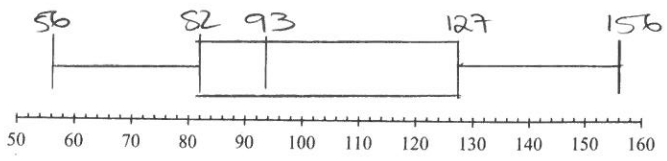
QUESTION/*VRAAG* 1

56	68	69	71	71	72	82	84	85
88	89	90	92	93	94	96	97	99
102	103	127	128	134	135	137	144	156

	Solution/*Oplossing*	**Marks** *Punte*
1.1	Range = 156 − 56 = 100	(2)
1.2	71	(1)
1.3	93	(1)
1.4	$Q_3 - Q_1$ = 127 − 82 = 45	(3)
1.5		(2)

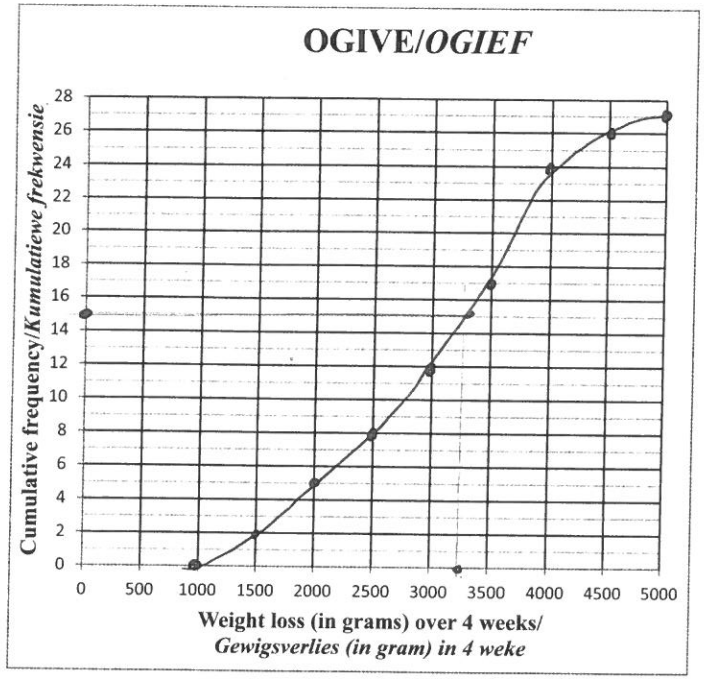
1.6	$\sigma = 25,84$	(2)
1.7	$\bar{x} = 98,59$ $(98,59 - 25,84;\ 98,59 + 25,84)$ $(72,75;\ 124,43)$ Yes she does weigh more than one std dev	(3)
		[14]

QUESTION/*VRAAG* 2

WEIGHT LOSS OVER 4 WEEKS (IN GRAMS)/ *GEWIGSVERLIES IN 4 WEKE (IN GRAM)*		**FREQUENCY/ *FREKWENSIE***	
$1\,000 < x \leq 1\,500$	1250	2	2500
$1\,500 < x \leq 2\,000$	1750	3	5250
$2\,000 < x \leq 2\,500$	2250	3	6750
$2\,500 < x \leq 3\,000$	2750	4	11000
$3\,000 < x \leq 3\,500$	3250	5	16250
$3\,500 < x \leq 4\,000$	3750	7	26250
$4\,000 < x \leq 4\,500$	4250	2	8500
$4\,500 < x \leq 5\,000$	4750	1	4750

	Solution/*Oplossing*	**Marks *Punte***
2.1	$\therefore$ Mean $= \frac{81250}{27}$ $= 3009{,}26$	(2)

2.2



(4)

2.3

$800 \times 4 = 3200$

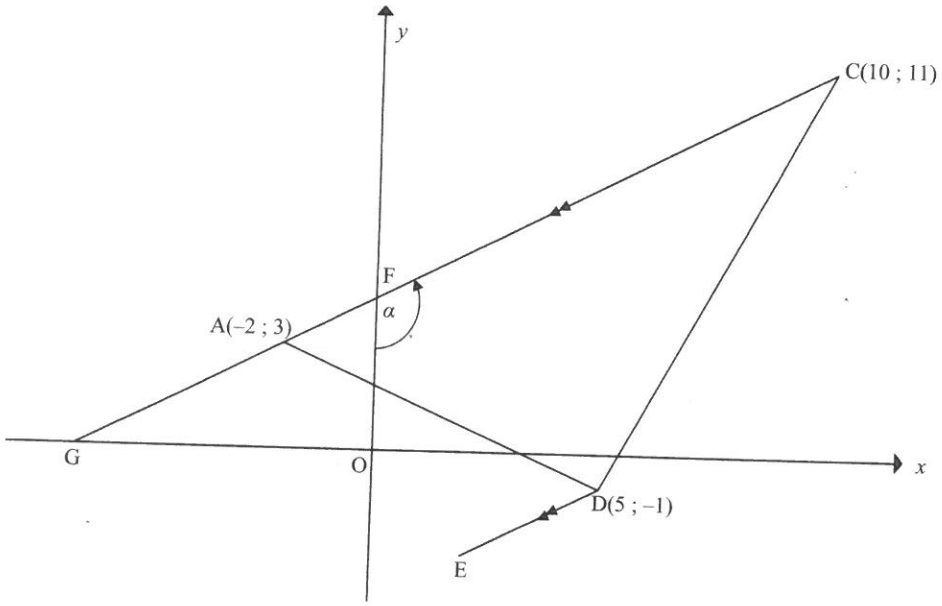
$3200 \Rightarrow \pm 15$

$27 - 15 = \pm 12.$

(2)

[8]

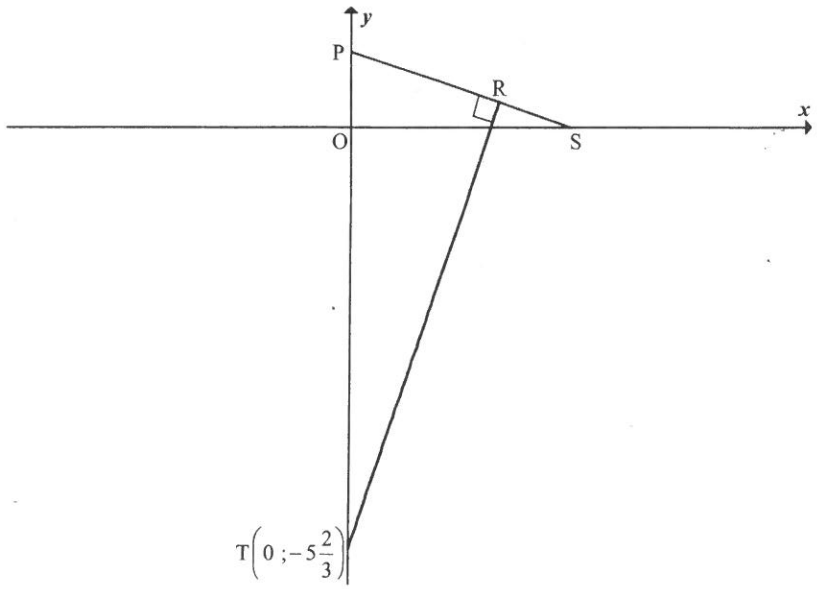
QUESTION/*VRAAG* 3



	Solution/*Oplossing*	Marks *Punte*
3.1	$m_{AC} = \frac{11-3}{10+2}$ $= \frac{2}{3}$	(2)
3.2	$m_{DE} = \frac{2}{3}$ $y = \frac{2}{3}x + c$ $-1 = \frac{2}{3}(5) + c$ $-\frac{13}{3} = c$ $y = \frac{2}{3}x - \frac{13}{3}$	(3)

	Solution/*Oplossing*	Marks *Punte*
3.3	$m_{CG} = \frac{2}{3}$ $\tan\theta = \frac{2}{3}$ $\theta = 33{,}69°$ $\hat{O} = 90°$ $\alpha = 33{,}69 + 90$ Ext $\angle$ of $\triangle$ $= 123{,}69$	(3)
3.4.1	$M_{BE} = M_{AD}$ $M_{AD}\left(\frac{-2+5}{2}; \frac{3-1}{2}\right)$ $\left(\frac{3}{2}; 1\right)$	(3)
3.4.2	Diagonal BE = Diagonal AD $AD = \sqrt{(-2-5)^2 + (3+1)^2}$ $= \sqrt{65}$ $= 8{,}06$	(3) **[14]**

QUESTION/*VRAAG* 4

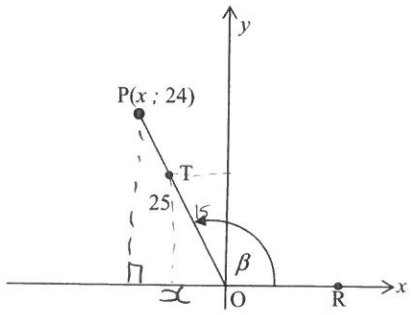


	Solution/*Oplossing*	Marks *Punte*
4.1	$x+ay-a=0$ $ay=-x+a$ $y=\frac{-x}{a}+1$ ∴ P(0;1)	(2)
4.2	S(3;0) as OS = 3OP $0=\frac{-3}{a}+1$ $-1=\frac{-3}{a}$ $-a=-3$ $a=3$	(2)

	Solution/*Oplossing*	Marks *Punte*
4.3	$m_{PS}=-\frac{1}{3}$ ∴ $m_{RT}=3$ $y=3x+c$ ∴ $y=3x-5\frac{2}{3}$ $y=3x-\frac{17}{3}$ OR	(3)
4.4	$3x-\frac{17}{3}=\frac{-x}{3}+1$ $9x-17=-x+3$ $10x=20$ $x=2$ $y=3(2)-\frac{17}{3}$ $=\frac{1}{3}$ ∴ R$(2;\frac{1}{3})$	(4)
4.5	Area $=\frac{1}{2}b\times h$ Area $=\frac{1}{2}\cdot\frac{2\sqrt{10}}{3}\times 2\sqrt{10}$ $=\frac{20}{3}$ PR $=\sqrt{(0-2)^2+(1-\frac{1}{3})^2}$ $=2,108=\frac{2\sqrt{10}}{3}$ TR $=\sqrt{(2-0)^2+(\frac{1}{3}+5\frac{2}{3})^2}$ $=2\sqrt{10}$ $=6,32$	(3)
4.6	PT is diameter → subtends a 90° ∴ PT $=1+5\frac{2}{3}$ $=6\frac{2}{3}$ radius $=\frac{10}{3}$	(2) **[16]**

QUESTION/*VRAAG* 5

5.1



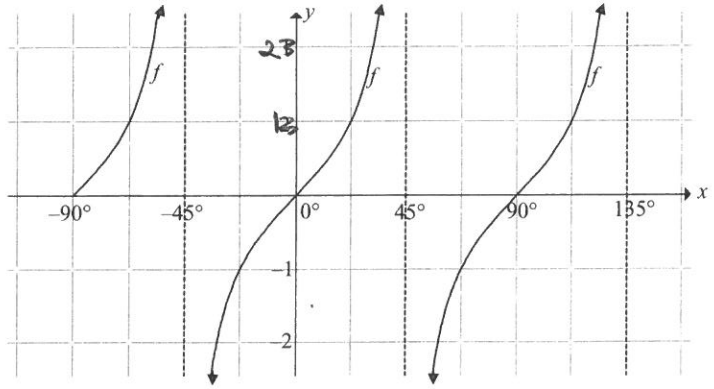
	Solution/Oplossing	Marks *Punte*
5.1.1	$25^2 = 24^2 + x^2$ $25^2 - 24^2 = x^2$ $7 = x$	(2)
5.1.2(a)	$\sin\beta = \frac{y}{r}$ $= 24/25$	(1)
5.1.2(b)	$\cos(180-\beta)$ $(180-\beta)$ is in 2nd quad. $-\cos\beta$ $-\frac{-7}{25}$ $\frac{7}{25}$	(2)
5.1.2(c)	$\tan(-\beta)$ $-\tan\beta$ $-\frac{24}{-7}$ $+\frac{24}{7}$	(2)

	Solution/*Oplossing*	Marks *Punte*
5.1.3*	$\frac{15}{25} = \frac{y}{24}$ $\frac{315}{25} \times 24 = y$ $\frac{72}{5} = y$	(4)
	$\frac{15}{25} = \frac{x}{7}$ $\frac{315 \times 7}{25} = x$ $-\frac{21}{5} = x$	
5.2	$\frac{2\sin x\cos x(1+\tan^2 x)}{\tan x}$ $\frac{2\sin x\cos x}{\tan x}\left(1+\frac{\sin^2 x}{\cos^2 x}\right)$ $\frac{2\sin x\cos x}{\tan x}\left(\frac{\cos^2 x+\sin^2 x}{\cos^2 x}\right)$ $\frac{2\sin x\cos x}{\cos^2 x}(1) \div \frac{\sin x}{\cos x}$ $\frac{2\sin x\cos x}{\cos^2 x} \times \frac{\cos x}{\sin x}$ $= 2.$	(4)
5.3.1	$\frac{1-\cos^2 A}{4\cos(90+A)\sin^2 A}$ $\frac{\sin A}{-4\sin A}$ -4	(3)

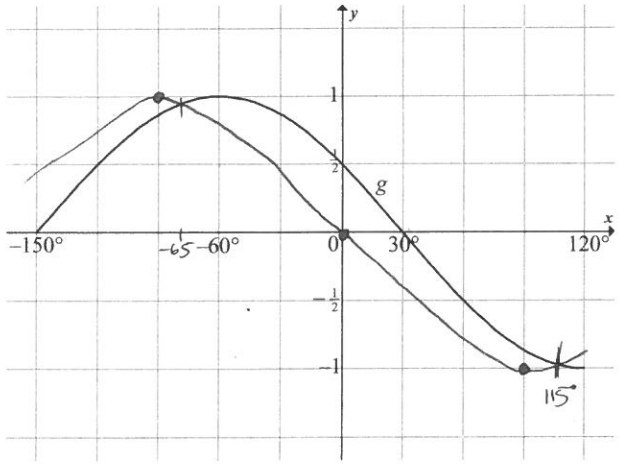
	Solution/*Oplossing*	**Marks** *Punte*
5.3.2	$\frac{1-\cos^2 2x}{4\cos(90+2x)} = 0,21$ $\frac{\sin A}{-4} = 0,21$ $\sin A = -0,84$ $\sin 2x = -0,84$ $RA = 57,14$ 3rd: $2x = 180+57,14+k360$ $2x = 237,14+k360$ $x = 118,57+k180$ 4th: $2x = 360-57,14+k360$ $2x = 302,86+k360$ $x = 151,43+k180$ $k \in Z$	(6)
		[24]

Additional space/*Bykomende ruimte*

QUESTION/*VRAAG* 6



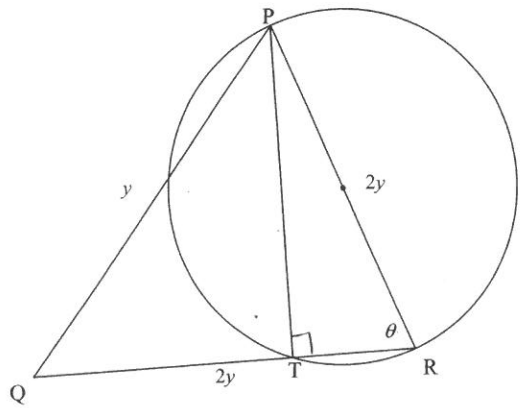
	Solution/*Oplossing*	**Marks** *Punte*
6.1.1	$b = 2$	(1)
6.1.2	$45 < x \leq 67,5$	(2)
6.1.3	$x = -10$ $x = 80$	(2)

	Solution/*Oplossing*	**Marks** *Punte*
6.2.1		(4)
6.2.2	cos(x+60) − Minimum is at −1 ∴ New minimum is at −4.	(2)
6.2.3	cos(x+60) + sin x = 0 cos(x+60) = −sin x. cos(x+60) = −cos(90−x) ∴ RA: x+60 = 90−x. 2nd: x+60 = 180−(90−x); x = 90+x−60; N/S: 150 3rd: x+60 = 180+(90−x)+k360; x+60 = 270−x+k360; 2x = 210+k360; x = 105°+k180° ∴ at −75; 105°	(6)

	Solution/*Oplossing*	**Marks** *Punte*
6.2.4	cos(x+60) + sin x > 0. cos(x+60) > sin x ∴ −75 < x < 105.	(2)
6.2.5	y = −sin(x−θ) ∴ θ = 30°	(2)
		[21]

	Additional space/*Bykomende ruimte*	**Marks** *Punte*

QUESTION/*VRAAG* 7



	Solution/*Oplossing*	Marks *Punte*
7.1	$(2y)^2+(2y)^2-2.2y2y\cos\theta=y^2$ $4y^2+4y^2-8y^2\cos\theta=y^2$ $-8y^2\cos\theta=y^2-4y^2-4y^2$ $\cos\theta=\frac{-7y^2}{-8y^2}$ $\cos\theta=\frac{7}{8}$ $T=90°$; L's in semi circle.	(4)
7.2	$\frac{PT}{\sin\theta}=\frac{2y}{\sin 90}$ OR $\sin\theta=\frac{PT}{2y}$ $PT=\frac{2y\sin\theta}{1}$ $2y\sin\theta=PT$	(3)
		[7]

QUESTION/*VRAAG* 8

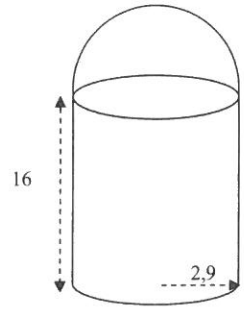


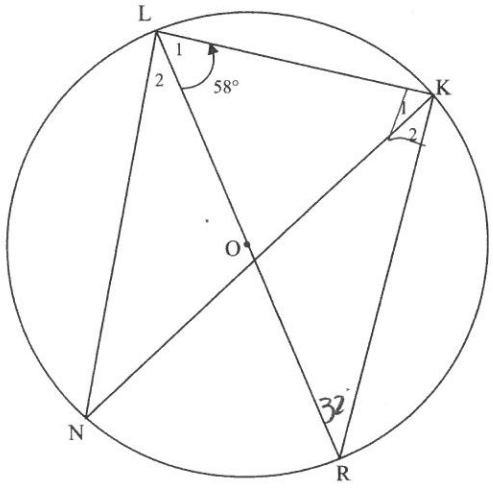
FIGURE 1

FIGURE 2

	Solution/*Oplossing*	Marks *Punte*
8.1	$SA=2\pi r^2+2\pi rh-\pi r^2+\frac{1}{2}.4\pi r^2$ $=2\pi(2,9)^2+2\pi(2,9).16-\pi(2,9)^2+2\pi(2,9)^2$ $=370,80cm^2$	(5)
8.2	$V=\frac{1}{2}.\frac{4}{3}\pi r^3$ $=\frac{2}{3}\pi(2,9)^3$ $=57,08$ but 80% ... $51,08\times 0,8$ $=40,86cm^3$.	(3)
		[8]

Give reasons for your statements and calculations in QUESTIONS 9, 10 and 11.
Gee redes vir jou bewerings en berekeninge in VRAAG 9, 10 en 11.

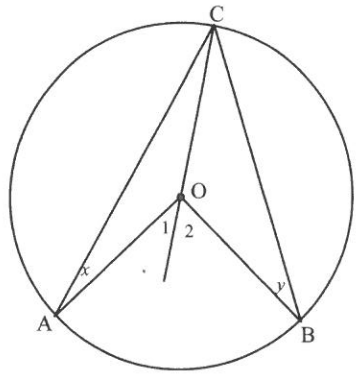
QUESTION/*VRAAG* 9



	Solution/*Oplossing*	Marks *Punte*
9.1	$\hat{LKR} = 90°$ L in semi circle	(2)
9.2	$\hat{R} = 180 - 90 - 58$ int L's of Δ $= 32°$	(2)
9.3	$N = 32°$ L's in same seg.	(2)
		[6]

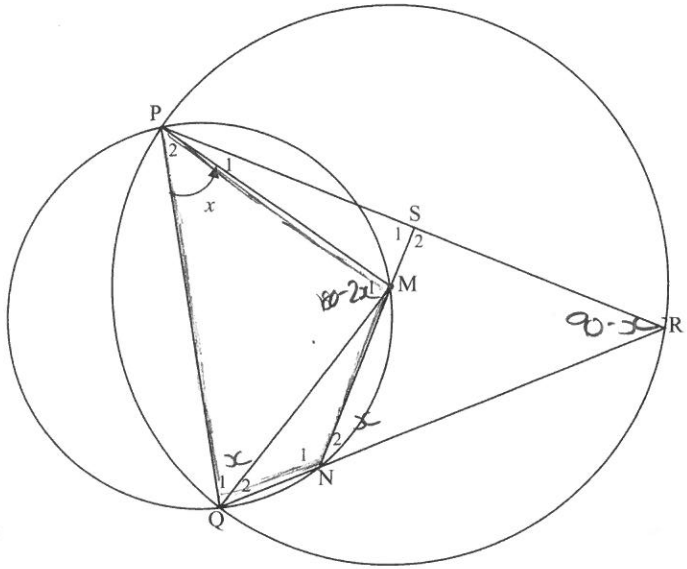
QUESTION/*VRAAG* 10

10.1



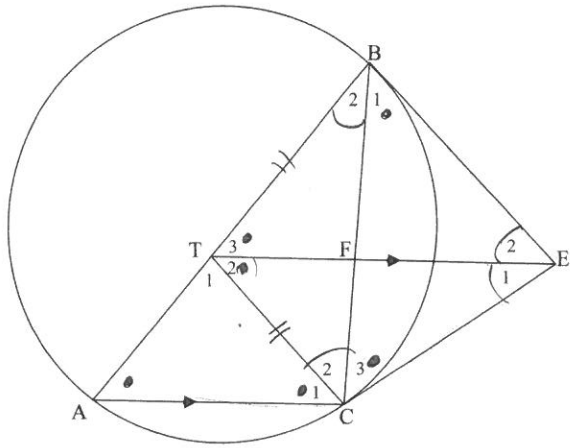
	Solution/*Oplossing*	Marks *Punte*
10.1.1	$OA = OC$ radii $\therefore C_1 = x$ L's opp = sides $\therefore O_1 = 2x$ Ext L of Δ = int opp L's.	(3)
10.1.2	$OB = OC$ radii $C_2 = y$ L's opp = sides $\therefore O_2 = 2y$ Ext L of Δ OR sim $O_2 = 2y$. $\therefore \hat{C} = x + y$ $\hat{O} = 2x + 2y$ $\therefore AOB = 2ACB$	(3)

10.2



	Solution/*Oplossing*	Marks *Punte*
10.2.1	$N_2 = x$ Ext $\angle$ of cyclic quad PMNQ.	(1)
10.2.2	MP = MQ radii $Q_1 = x$ $\angle$'s opp = sides.	(2)
10.2.3	$\hat{M} = 180 - 2x$ int $\angle$'s of $\triangle$ $\hat{R} = 90 - x$ $\angle$ at cnt = 2 x $\angle$ at circum In $\triangle$NSR	(3)
10.2.4	$S_2 = 180 - (90 - x) - x$ int $\angle$'s of $\triangle$ $S_2 = 90°$ $\therefore$ SM $\perp$ PR $\therefore$ SP = SR line from cnt $\perp$ chord.	(3)
		[15]

QUESTION/*VRAAG* 11



	Solution/*Oplossing*	Marks *Punte*
11.1	$B_1 = A$ tan chord $A = T_3$ corr $\angle$'s ET $\parallel$ AC $\therefore B_1 = T_3$	(4)
11.2	$\hat{C}_3 = B_1$ ext $\angle$ cyclic quad $\therefore C_3 = T_3$ (B_1) $\therefore$ TBEC is cyclic conv of $\angle$'s in same seg.	(4)

11.3	$\hat{B}_1 = \hat{T}_2$ $\angle$'s in same seg $\hat{B}_1 = \hat{T}_3$ proven $\therefore \hat{T}_1 = \hat{T}_3$ $\therefore$ ET bisects $B\hat{T}C$	(2)
11.4	$\hat{B}_2 = \hat{E}_2$ tan chord. $\hat{B}_2 = \hat{C}_2$ $\hat{E}_2 = \hat{C}_2$ $\angle$'s in same seg $\therefore \hat{B}_2 = \hat{C}_2$ $\therefore$ TB = TC sides opp = $\angle$'s.	(4)
11.5	BT = TC proven In $\triangle$TAC $\hat{A} = \hat{C}_1$ proven $\therefore$ TA = TC sides opp = $\angle$'s. $\therefore$ TA = TC = BT $\therefore$ T is cnt of $\odot$	(3)
		[17]

$\hat{A}_1 = \hat{T}_3$
$\hat{T}_3 = \hat{T}_2$
$\hat{T}_2 = \hat{C}_1$
$\therefore \hat{A}_1 = \hat{C}_1$