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Grade/Class : 10/..... Mathematics Teacher : .....

MATHEMATICS
NOVEMBER 2021 FINAL ASSESMENT PAPER II
ANSWER BOOKLET

100

QUESTION 1

1.1.1 $30 < x \leq 40$ ✓ (1)

1.1.2 $\bar{x} \approx \frac{5(5)+13(15)+23(25)+27(35)+18(45)+7(55)+2(65)}{98}$ ✓midpt ✓xf ✓÷n

$= 31,43$ ✓ (4)

1.1.3 $D_7 = T_{\frac{7}{10}(n+1)}$ $\frac{7}{10}(1+98)$

$= T_{69,3}$ ✓

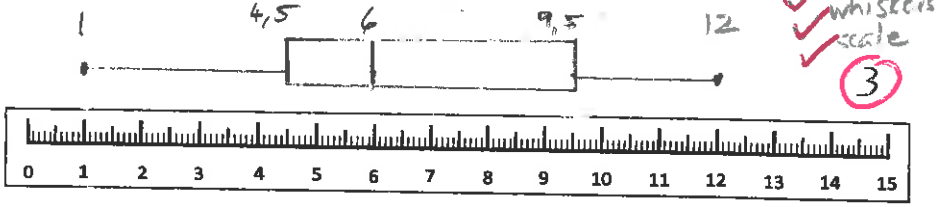
$= \frac{T_{69}+T_{70}}{2}$

$D_7 = 30 < x \leq 40$ ✓ a.o ½ (2)

1.2.1

I = 1	Calculator OR STAT MODE	
II = 4,5	$Q_1 = T_{\frac{1}{4}(1+8)}$	
III = 6 ✓	$= T_{4,5}$	
IV = 9,5	$= 4,5$	
V = 12		
	$Q_3 = T_{\frac{3}{4}(10+17)}$	
$M = T_{\frac{1}{2}(1+17)}$	$= T_{13,5}$	
$= T_9$	$= 9,5$	
$= 6$		
• $T_1; \ldots; T_8; (T_9); T_{10}; \ldots; T_{17}$ (M)		(1)

1.2.2



✓box ✓whiskers ✓scale (3)

1.3

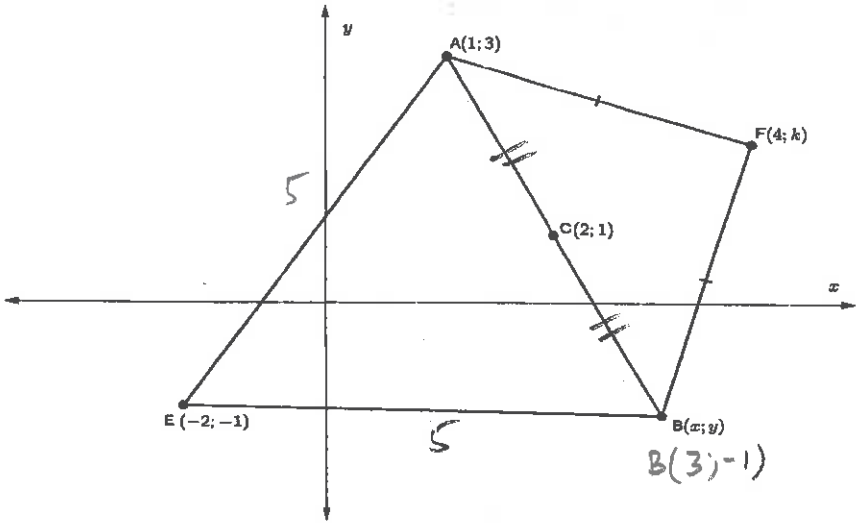
$25 \times 68 = 1700$ ✓

$-18 + 81 = 1763$ ✓

$\bar{x} = \frac{1763}{25}$

$\bar{x} = 70,52$ ✓ (3)

QUESTION 2



2.1.	$AE = \sqrt{(1-(-2))^2 + (3-(-1))^2}$ ✓ $= \sqrt{25}$ $AE = 5$ ✓	2
2.2.	$C_x = \left(\frac{Ax + Bx}{2}\right)$ $C_y = \left(\frac{Ay + By}{2}\right)$ $2 = \frac{1+x}{2}$ $1 = \frac{3+y}{2}$ $4 = 1+x$ $2 = 3+y$ $x = 3$ $y = -1$ $B(3; -1)$ ✓✓	2
2.3	$EB = \sqrt{(3-(-2))^2 + (-1-(-1))^2}$ ✓ $= \sqrt{25}$ $EB = 5$ ✓	2

2.4	Kite ✓ 2 prs adj sides equal =	1
2.5	$m_{EC} = m_{CF}$ ✓method $\frac{1-(-1)}{2-(-2)} = \frac{k-1}{4-2}$ ✓ $\frac{2}{4} = \frac{k-1}{2}$ $1 = k-1$ $k = 2$ ✓	4
2.6	$m_{AF} = -\frac{1}{3}$ ✓ $AF^2 = 10$ ✓ $m_{BF} = 3$ ✓ $FB^2 = 10$ ✓ OR $AB^2 = 20$ ✓ $m_{AF} \times m_{BF} = (-\frac{1}{3}) \times (3)$ ✓ $AB^2 = AF^2 + FB^2$ $= -1$ ✓ $\therefore \hat{F} = 90°$ $\therefore \hat{F} = 90°$ ✓R converse Pythag	4
2.7	$A(1; 3) \xrightarrow{\rightarrow 3} \downarrow 1 \; F(4; 2)$ $B(3; -1) \xrightarrow{\rightarrow 3} \downarrow 1 \; D(6; -2)$ ✓ OR $A(1; 3) \xrightarrow[\downarrow 4]{\rightarrow 2} (3; -1)$ $F(4; 2) \xrightarrow[\downarrow 4]{\rightarrow 2} D(6; -2)$	2

QUESTION 3

3.1.1 $(\sin(2\times 25^\circ))^2$

$= 0,59$ ✓ (1)

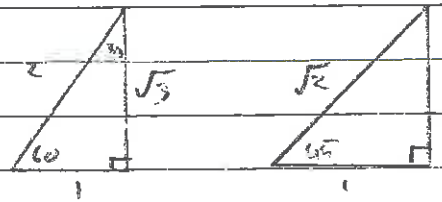
3.1.2 $\frac{5}{\cos 55^\circ}$

$= 8,72$ ✓ (1)

3.1.3 $\frac{1}{\cos(60^\circ) - 3}$

$= -0,48$ ✓ (1)

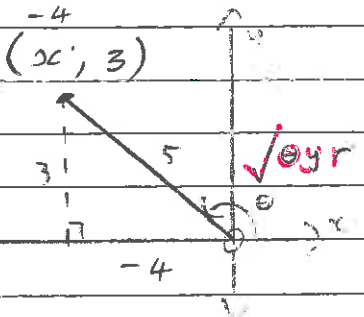
3.2



3.2.1 $\tan 30^\circ = \frac{1}{\sqrt{3}}$ ✓ spec A must be shown (1)

3.2.2 $\cos 45^\circ = \frac{1}{\sqrt{2}}$ ✓ spec A must be shown. (1)

3.3 $\sin\theta = \frac{3}{5}$



$x^2 = r^2 - y^2$

$= 5^2 - 3^2$

$= \pm 4$

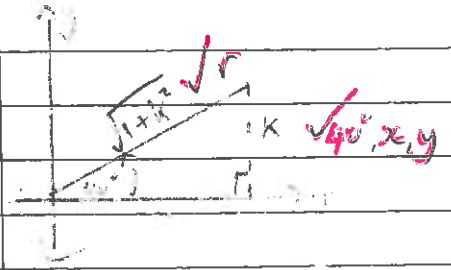
$x = -4$ ✓ x

$y = 3$

$r = 5$

3.3 $\tan\theta = \frac{3}{-4}$ ✓ $\frac{y}{x}$ ✓ ✓ 0/3 (3)

3.4 $\tan 40^\circ = \frac{k}{1}$



$\sec 40^\circ = \frac{r}{x}$

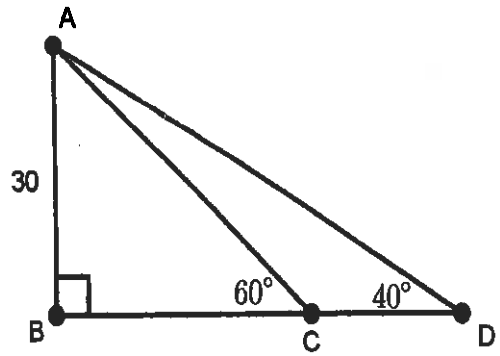
$= \frac{\sqrt{1+k^2}}{1}$ (3)

$= \sqrt{1+k^2}$ ✓

QUESTION 4

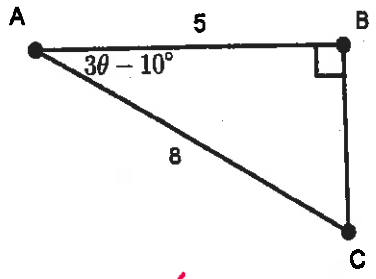
4.1.1	$\sin x = 0,28$ ✓	
	$x = \sin^{-1}(0,28)$	
	$x = 16,26°$ ✓	2
4.1.2	$\cot x = \frac{2}{3}$ ✓	
	$\tan x = \frac{3}{2}$ ✓	
	$x = \tan^{-1}\left(\frac{3}{2}\right)$	
	$x = 56,31°$ ✓	3
4.1.3	$\tan 2x = 3,276...$ ✓	
	$2x = \tan^{-1}(3,276...)$	
	$2x = 73,028...°$ ✓	
	$x = 36,51°$ ✓	3

4.2



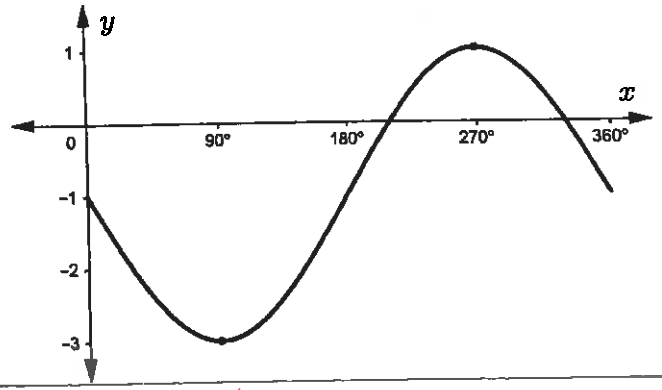
4.2.1	$\tan 60° = \frac{30}{BC}$ ✓	
	$BC = \frac{30}{\tan 60°}$	
	$BC = 17,32$ ✓	2
4.2.2	$\tan 40° = \frac{30}{BD}$ ✓	
	$BD = \frac{30}{\tan 60°}$	
	$BD = 35,75$ ✓	
	$CD = BD - BC$	
	$= 35,75 - 17,32$	
	$CD = 18,43$ ✓	3

4.3



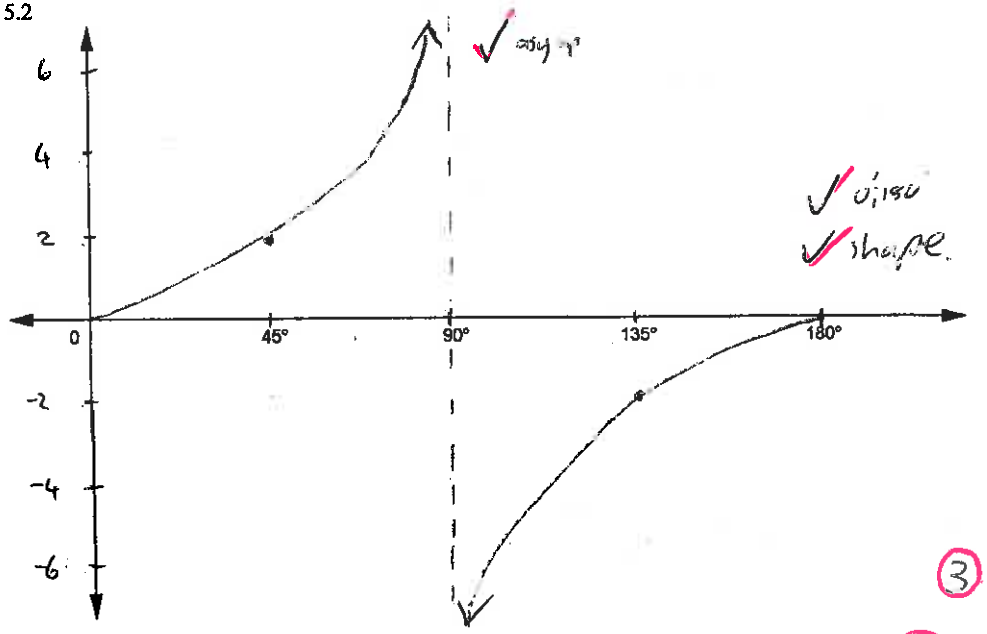
4.3	$\cos A = \frac{5}{8}$ ✓	
	$A = \cos^{-1}\left(\frac{5}{8}\right)$	
	$A = 51,31...°$ ✓	
	$3\theta - 10 = 51,31...°$	
	$\theta = 20,66°$ ✓	3

QUESTION 5



5.1.1.a)	$a = -2$ ✓	1
5.1.1.b)	$q = -1$ ✓	1
5.1.2	2 ✓	1
5.1.3	$x \in (90°; 270°)$ ✓	1
5.1.4	$y \in [-3; 1]$ ✓	1

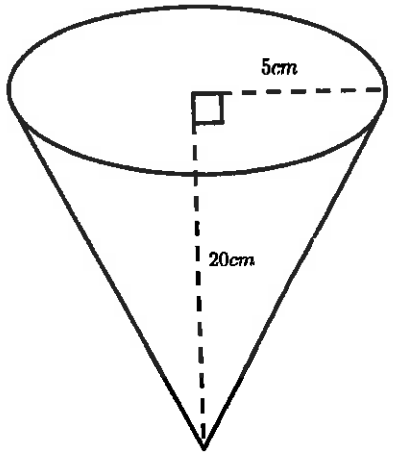
5.2



3

5.2.2	180°	1
5.2.3	$y = 2\tan x$ $y = 2\tan x - 3$ ✓ $-y = 2\tan x - 3$ $y = -2\tan x + 3$ ✓	2

QUESTION 6

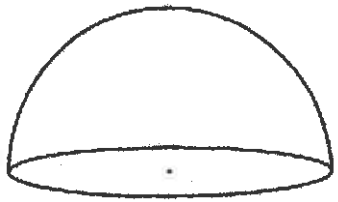


$A = \pi r^2$
$A = \pi r h_s$
$V = \frac{1}{3}Ah$

6.1.1	$TSA = \pi r^2 + \pi r h_s$ ✓ ✓ $= \pi(5)^2 + \pi(5)(20,61\ldots)$ ✓ $= 402,37\ cm^2$ ✓	4
6.1.2	$V = \frac{1}{3}(\pi r^2)(h)$ ✓ $= \frac{1}{3}(\pi(5)^2)(20)$ $= 523,60\ cm^3$ ✓	2

$h_s^2 = 20^2 + 5^2$
$= 425$ ✓
$h_s = 20,61\ldots$
(Pythag)

6.2



$$V = \frac{4}{3}\pi r^3$$

6.2 $d \to 2d \therefore r \to 2r$ ✓

$V = \frac{1}{2}\left(\frac{4}{3}\pi r^3\right)$ $\quad V_{NEW} = \frac{1}{2}\left(\frac{4}{3}\pi(2r)^3\right)$

$= \frac{1}{2}\left(\frac{4}{3}\pi(8r^3)\right)$ ✓

$= 8 \cdot \frac{1}{2}\left(\frac{4}{3}\pi r^3\right)$

$= 8 \cdot 30$

$= 240\ cm^3$ ✓ (3)

OR

$30 = \frac{1}{2}\frac{4}{3}\pi r^3$ ✓

$14{,}32\ldots = r^3$

$r = \sqrt[3]{14{,}32\ldots}$

$= 2{,}42\ldots$

d doubles $\Rightarrow$ r doubles

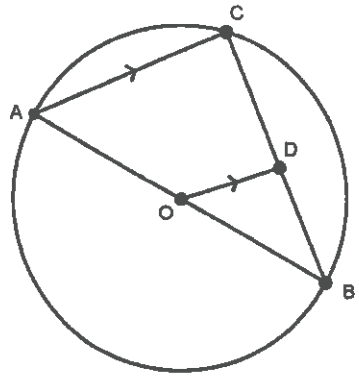
$\therefore r_{new} = 2{,}42\ldots \times 2$

$= 4{,}85\ldots$ ✓

$V_{new} = \frac{1}{2}\frac{4}{3}\pi(4{,}85\ldots)^3$

$= 240\ cm^3$ ✓

QUESTION 7



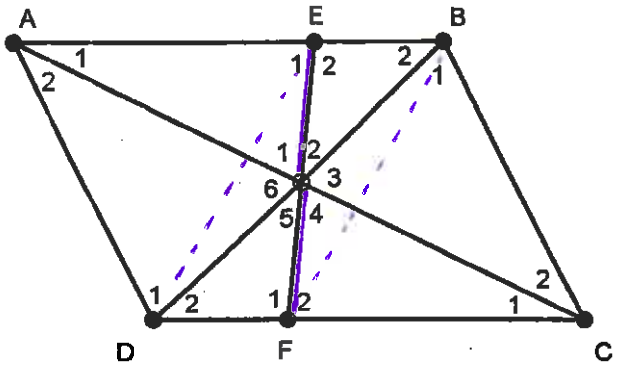
7.1 $AO = OB$ ✓SR radii

$\therefore CD = DB$ line through midpt ✓R ∥ to 2nd side (2)

✓S ✓R

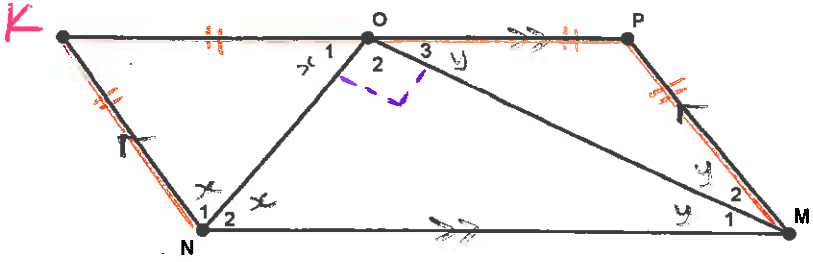
7.2 $AC = 6\ cm$ midpt thm (2)

QUESTION 8



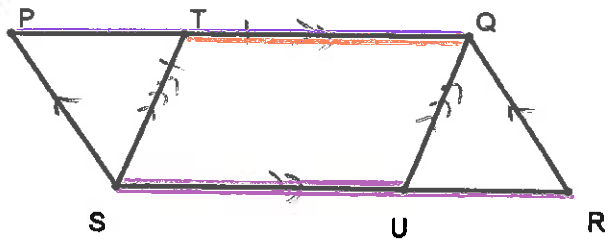
8.1	In △'s OBE, ODF (or △'s AEO, CFO)	
	$\hat{O}_2 = \hat{O}_5$ ✓S+R vert opp ∠'s =	
	OB = OD ✓S+R diags ||gm bisect	
	$\hat{B}_2 = \hat{D}_2$ ✓S+R alt ∠'s =; AB ∥ CD	
	∴ △OBE ≡ △ODF ✓S AA corr S ✓R	
	∴ OE = OF △OBE ≡ △ODF	(5)
8.2	OE = OF proven	
	DO = OB proven	
	∴ EDFB is ||gm diags ✓R quad bisect	(1)

QUESTION 9



9.1	let $\hat{N}_2 = \hat{N}_1 = x$	
	$\hat{M}_1 = \hat{M}_2 = y$	
	$2x + 2y = 180°$ ✓S+R coint ∠'s = 180°. KN ∥ PM	
	∴ $x + y = 90°$ ✓S	
	$N\hat{O}M = 90°$ ✓R sum ∠'s in △ = 180°	(3)
9.2	$\hat{O}_1 = x$ ✓S+R alt ∠'s =, KP ∥ NM	
	∴ $\hat{N}_1 = \hat{O}_1$ both = x	
	∴ KO = KN ✓S+R sides opp = ∠'s	
	Similarly OP = PM ✓S+R	
	KN = PM ✓S opp sides ||gm =	
	∴ KO = OP ✓	
	∴ O is midpt of KP	(7)

QUESTION 10



10.1	PQ = SR ✓S+R opp sides ||gm =	
	TQ = SU ✓S+R sides rhomb =	
	PT = PQ - TQ	
	UR = SR - SU	
	but PQ = SR and TQ = SU	
	UR = PQ - TQ	
	∴ UR = PT	(2)
10.2	PQ ∥ SR opp sides ||gm ∥	
	PT = UR (10.1.)	
	∴ area △PTS = area △URQ ✓ same b(PT=UR) same h(PQ∥SR)	(2)