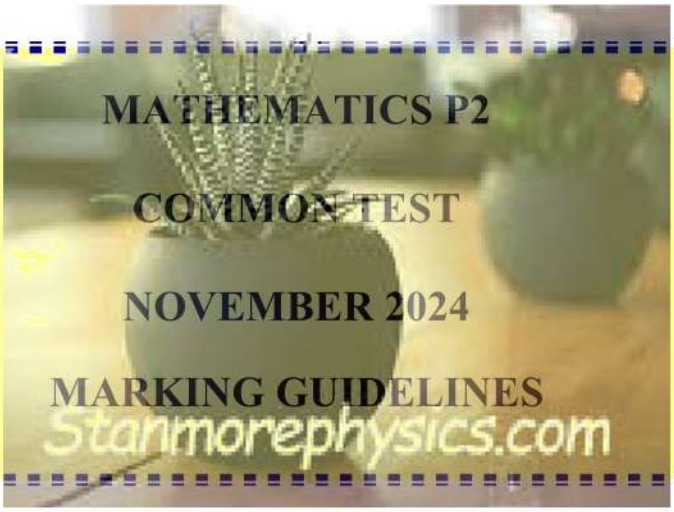
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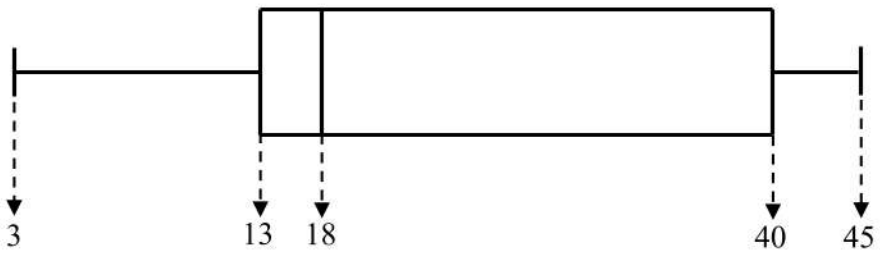
GRADE 10

MARKS: 100

The marking guidelines consist of 10 pages.

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QUESTION 1

1.1	Range = Max – Min = 45 – 3 = 42 **Answer only, full marks**	✓A substitution ✓CA answer (only if subst was shown) (2)
1.2	$\bar{x} = \frac{356}{15}$ = 23,73 **Answer only, full marks**	✓A 356 ✓CA answer (only if divided by 15) (2)
1.3	Min = 3 Q_1 = 13 Q_2 = 18 Q_3 = 40 Max = 45	✓A Min and Max ✓A Q_2 ✓A Q_1 and Q_3 (3)
1.4		✓CA Min and Max ✓CA Q_2 ✓CA Q_1 and Q_3 (3)
1.5	IQR = $Q_3 - Q_1$ = 40 – 13 = 27 **Answer only, full marks**	✓A formula ✓CA substitution ✓CA answer (3)
		[13]

QUESTION 2

2.1	$20 \le x < 30$	✓A answer (1)
2.2	$30 \le x < 40$	✓A answer (1)
2.3	$\bar{x} = \frac{(25\times29)+(35\times28)+(45\times21)+(55\times15)+(65\times10)+(75\times2)}{105}$ $= \frac{4275}{105}$ = 40,71 **Answer only, full marks**	✓A midpoints ✓CA 4275 ✓A 105 ✓CA answer (4)
	Penalise for Rounding here	**[6]**

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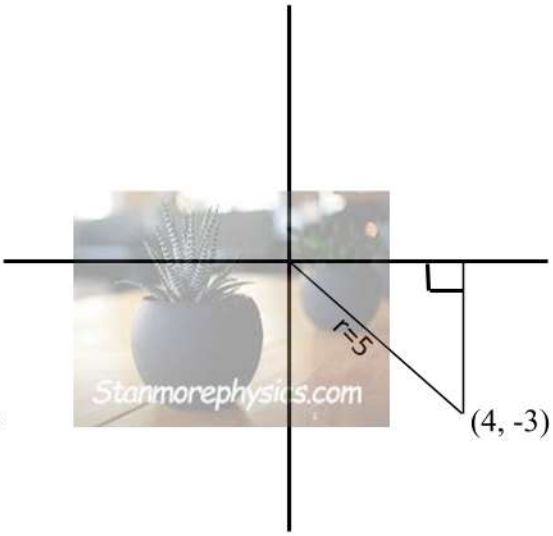
QUESTION 3

3.1	$M_{AC}\left(\frac{x_1+x_2}{2};\frac{y_1+y_2}{2}\right)$ $R\left(\frac{2+(-3)}{2};\frac{-1+0}{2}\right)$ $R\left(\frac{-1}{2};\frac{-1}{2}\right)$ **Answer only, full marks**	✓A substitution ✓CA $x-$value ✓CA $y-$value On condition the coordinates of A and C are used ONLY (3)
3.2	$m_{AB}=\frac{y_2-y_1}{x_2-x_1}$ $m_{AB}=\frac{2-0}{0-(-3)}$ $m_{AB}=\frac{2}{3}$ **Answer only, full marks**	✓A substitution ✓CA answer (2)
3.3	$AC=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ $AC=\sqrt{(2-(-3))^2+(-1-0)^2}$ $AC=\sqrt{26}$	✓A formula ✓A substitution ✓CA answer (3)
3.4	$BR=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ $BR=\sqrt{\left(\frac{-1}{2}-0\right)^2+\left(\frac{-1}{2}-2\right)^2}$ $BR=\frac{\sqrt{26}}{2}$ $Area\ of\ ABCD=2\left(\frac{1}{2}(AC)(BR)\right)$ $=\left(\sqrt{26}\right)\left(\frac{\sqrt{26}}{2}\right)$ $=13 units^2$	✓CA substitution ✓CA distance of BR ✓CA area of $\Delta\times 2$ ✓CA substitution ✓CA answer

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	OR $d_{AD} = \sqrt{(-3+1)^2 + (0+3)^2}$ $= \sqrt{13}$ $d_{DC} = \sqrt{(-1-2)^2 + (-3+1)^2}$ $= \sqrt{13}$ $Area\ of\ ABCD = base \times height$ $= d_{AD} \times d_{DC}$ $= \sqrt{13} \times \sqrt{13}$ $= 13 units^2$	**OR** ✓CA length of AD ✓CA length of DC ✓A formula for area ✓CA substitution ✓CA answer
	OR $diagonal\ AC\ \&\ BD = \sqrt{26}\ units$ $Area\ of\ ABCD = \frac{1}{2}(d_{AC} \times d_{BD})$ $= \frac{1}{2}(\sqrt{26} \times \sqrt{26})$ $= 13 units^2$	**OR** ✓CA✓CA subst & length of DB ✓A formula for area ✓CA substitution ✓CA answer (5)
		[13]

QUESTION 4

4.1	$\tan\theta = \frac{-3}{4}$  $r^2 = x^2 + y^2$ $r^2 = 4^2 + (-3)^2$ $r = 5$ $\therefore \sin\theta = \frac{-3}{5}$	✓A $\tan\theta = \frac{-3}{4}$ ✓A value of r ✓CA answer (3)

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4.2	$10\cos^2\theta$ $=10\left(\frac{4}{5}\right)^2$ $=\frac{32}{5}$ **OR** $\frac{10}{\sec^2\theta}$ $=\frac{10}{\left(\frac{5}{4}\right)^2}$ $=\frac{32}{5}$	✓CA substitution ✓CA answer **OR** ✓CA substitution ✓CA answer (2)
4.3	$3\cot\theta+5\sin\theta$ $=3\left(\frac{-4}{3}\right)+5\left(\frac{-3}{5}\right)$ $=-4-3$ $=-7$ **OR** $\frac{3}{\tan\theta}+5\sin\theta$ $=\frac{3}{\left(\frac{-3}{4}\right)}+5\left(\frac{-3}{5}\right)$ $=-4-3$ $=-7$ **Answer only, max 2/3** **See notes on last page** **Answer only, max 2/3** **See notes on last page**	✓CA $\frac{-4}{3}$ ✓CA simplification ✓CA answer **OR** ✓CA $\frac{-3}{4}$ ✓CA simplification ✓CA answer (3)
		[8]

QUESTION 5

5.1.1	$\cos x=\frac{2}{3}$ $x=\cos^{-1}\left(\frac{2}{3}\right)$ $x=48{,}19^\circ$ **Answer only, full marks**	✓A simplification using arc cos ✓A answer (2)

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5.1.2	$\frac{4}{\cot x}=2$ $\cot x=2$ $\frac{1}{\tan x}=2$ $\tan x=\frac{1}{2}$ $x=26,57°$	✓A $\cot x=2$ ✓A $\frac{1}{\tan x}=2$ ✓CA answer (3)
5.2	$\frac{\tan 45^\circ.\cos ec60^\circ}{\cot 30^\circ.\cos^2 45^\circ}$ $=\frac{(1)\left(\frac{2}{\sqrt{3}}\right)}{(\sqrt{3})\left(\frac{\sqrt{2}}{2}\right)^2}$ $=\frac{\frac{2}{\sqrt{3}}}{\frac{2\sqrt{3}}{4}}$ $=\frac{4}{3}$ **See notes on last page** **OR** $\frac{\tan 45^\circ \tan 30^\circ}{\sin 60^\circ \cos^2 45^\circ}$ $=\frac{(1)\left(\frac{1}{\sqrt{3}}\right)}{\frac{\sqrt{3}}{2}\left(\frac{\sqrt{2}}{2}\right)^2}$ $=\frac{\frac{1}{\sqrt{3}}}{\frac{2\sqrt{3}}{8}}$ $=\frac{4}{3}$ **See notes on last page**	✓A $\frac{2}{\sqrt{3}}$ ✓A $\sqrt{3}$ ✓A $\left(\frac{\sqrt{2}}{2}\right)^2$ ✓CA simplification ✓CA answer **OR** ✓A $\frac{1}{\sqrt{3}}$ ✓A $\frac{\sqrt{3}}{2}$ ✓A $\left(\frac{\sqrt{2}}{2}\right)^2$ ✓CA simplification ✓CA answer (5)

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5.3.1	$\cos(x+y)$ $=\cos\left(56,3^\circ+97,5^\circ\right)$ $=\cos\left(153,6^\circ\right)$ $=-0,90$	✓A substitution ✓CA answer (2)
5.3.2	$\frac{2\sin^2 x-2}{\cos y}$ $=\frac{2\left(\sin 56,3^\circ\right)^2-2}{\cos 97,5^\circ}$ $=4,72$	✓A substitution in numerator ✓A substitution in denominator ✓CA answer (3)
		[15]

QUESTION 6

6.1	$p=2$ $q=1$	✓A ✓A (2)
6.2	$amplitude=1$	✓A (1)
6.3	$-2\le y\le 2$ **OR** $y\in[-2,2]$	✓A interval ✓A notation **OR** ✓A interval ✓A notation (2)
6.4	$0^\circ < x < 180^\circ$ **OR** $x\in(0^\circ;180^\circ)$	✓A interval ✓A notation **OR** ✓A interval ✓A notation (2)
6.5	$h(x)=-\cos x+1$	✓A $-\cos x$ ✓CA $+1$ (2)
		[9]

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QUESTION 7

7.1	$\frac{AE}{ED} = \sin 22^o$ $AE = 800.\sin 22^o$ $AE = 299,69cm$ $\therefore BE = 299,69 + 155$ $BE = 454,69cm$	✓A correct trig ratio ✓A AE=299,69 ✓ CA 299,69 + 155 ✓CA answer (4)
7.2	$\frac{AD}{ED} = \cos 22^o$ $AD = 800\cos 22^o$ $AD = 741,75$ $\therefore AD = BC\ (opposite\ sides\ of\ a\ rectangle)$ $BC = 741,75\ cm$ **OR** $AD^2 + AE^2 = ED^2$ $AD^2 + (299,69)^2 = (800)^2$ AD=741,75 $BC = 741,75cm$	✓A correct trig ratio ✓CA AD= 741,75 ✓CA answer **OR** ✓CA substitution ✓CA AD=741,75 ✓CA answer (3)
		[7]

QUESTION 8

8.1	$d = 2r$ $16 = 2r$ $r = 8$ $V = \frac{4}{3}\pi r^3$ $V = \frac{4}{3}\pi(8)^3$ $V = 2144,66\ mm^3$	✓A $r=8$ ✓A substitution ✓CA answer (3)
8.2	$r = 2 \times 8\,mm$ $= 16\,mm$ $V_{new} = \frac{4}{3}\pi(16)^3$ $= 17157,28467....$ $ratio = \frac{V_{new}}{V_{old}}$ $ratio = \frac{17157,28467}{2144,66}$ $ratio = \frac{8}{1}$ $\therefore V_{new} : V_{old} = 8 : 1$ **OR** $\frac{4}{3}\pi(16)^3 : \frac{4}{3}\pi(8)^3$ $(16)^3 : (8)^3$ $16^3 : 8^3$ $4096 : 512$ $8 : 1$	✓A substitution with new r ✓CA division of volumes ✓CA answer **OR** ✓A $\frac{4}{3}\pi(16)^3$ ✓CA simplification ✓CA answer (3)
		[6]

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QUESTION 9

9.1	In ΔWXY and ΔYZW 1) WY is common 2) $\hat{Y}_1 = \hat{W}_2$ (Alternate angles WZ // XY) 3) $\hat{X} = \hat{Z}$ (Given) $\therefore \Delta WXY \equiv \Delta YZW$ $(\angle, \angle, S)$ $XY = WZ$ $(\Delta WXY \equiv \Delta YZW)$ $\therefore$ WXYZ is a parallelogram (one pair of sides equal and //)	✓A S ✓A S/R ✓A R ✓A S/R ✓A R (5)
9.2.1(a)	$\hat{B} = 180° - 120°$ (co-interior angles AD // BC) $\hat{B} = 60°$ **Penalise for parallel lines here**	✓A S/R ✓A answer (2)
9.2.1(b)	$\hat{A} = \hat{C}$ opposite sides of a parm $\hat{C}_1 = 120°$ $\hat{C}_2 = 60°$ angles on a str. line **OR** $\hat{C}_2 = 180° - 120°$ (corr. angles AB//DC) $\hat{C}_2 = 60°$	✓A S/R ✓A S **OR** ✓A S/R ✓A answer (2)
9.2.2	$\hat{E} = \hat{C}_2$ angles opposite equal sides $\hat{E} + \hat{C}_2 + \hat{D}_2 = 180°$ sum of Δ $4x = 180° - 120°$ $4x = 60°$ $x = 15°$	✓A S/R ✓A R ✓A substitution ✓A answer (4)
		[13]

QUESTION 10

10.1	In ΔXGZ F and H are midpoints (Given) $\therefore$ HF//GZ (midpoint theorem) FE//YZ (same straight line) In ΔXYG H is the midpoint EH//YG (Proved) $\therefore$ E is the midpoint (line through midpt // to second side)	✓A S/R ✓A S ✓A R (3)
10.2	$X\hat{E}H = 90°$ (corr. angles EF//YZ) $\text{Area} = \frac{1}{2}(EH)(XE)$ $9,5 = \frac{1}{2} \times 3,5 \times XE$ $XE = \frac{38}{7} = 5,43$ $\therefore XY = \frac{76}{7} = 10,86cm$	✓A R ✓A Sub Corr formula ✓A $\frac{38}{7} = 5,43$ ✓CA $\frac{76}{7} = 10,86$ (4)
10.3	YG = 7 (midpt theorem) YZ = 14 (YG = GZ) $\text{Area} = \frac{1}{2} \times 14 \times \frac{76}{7}$ Area = $76cm^2$	✓A S ✓CA sub ✓CA answer (3)
		[10]

TOTAL: 100

NOTES:

QUESTION 4.3
Learners must show the **simplification** step to be awarded full marks.

QUESTION 5.2
Learners must show the **simplification** step to be awarded full marks.

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