JOHANNESBURG EAST DISTRICT

PLC COMMON PAPER

MATHEMATICS

TEST 2

GRADE 10

TERM 3 2025

MARKS: 50

DURATION: 1 HOUR

This question paper consists of 4 pages including the cover page.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of 3 questions.
2. Answer ALL the questions.
3. Present your answers according to the instructions of each question.
4. Clearly show ALL calculations, diagrams, graphs, et cetera which were used in determining the answer.
5. Answers only will NOT necessarily be awarded full marks.
6. An approved scientific calculator (non- programmable and non-graphical) may be used, unless stated otherwise.
7. If necessary, answers should be rounded- off to TWO decimal places, unless stated otherwise.
8. Number the questions according to the numbering system used in the question paper.
9. Write neatly and legibly.

QUESTION 1

1.1 Mary recorded the amount of data in megabytes (MB) that she used daily in the past 15 days.

3	10	12	13	15	15	16	18	24	26	34	40	42	43	45

1.1.1 Calculate the range of the data. (1)

1.1.2 Calculate the mean data usage. (2)

1.1.3 Draw a box and Whisker diagram to represent the data. (4)

1.1.4 Comment on the skewness of the data. (1)

1.2 The amount spent by 120 motorists at PB petrol garage on a certain day were recorded as shown in the table below.

Amount spent (in x Rands)	**Number of Motorists**
$0 < x \leq 50$	12
$50 < x \leq 100$	38
$100 < x \leq 150$	42
$150 < x \leq 200$	20
$200 < x \leq 250$	8

1.2.1 Write down the interval that has the least number of motorists (1)

1.2.2 Identify the modal class for the data (1)

1.2.3 Identify in which interval the thirtieth (30^{th}) percentile lies. (2)

1.2.4 Calculate the estimated mean of the data. (4)

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QUESTION 2

2.1 Given: P(A) = 0,4 ; P(B) = 0,5 and P(A and B)= 0,25 . Determine the:

2.1.1 P(not B) (1)

2.1.2 P(A or B) (3)

2.1.3 P((not A)and B) (2)

2.2 In a school of 70 Grade 10 learners, 32 learners take Economics (E), 43 take Mathematics (M) and 15 learners take neither of these two subjects.

Let the number of learners who take both subjects be x.

2.2.1 Show that $x = 20$. (3)

2.2.2 Draw a Venn diagram to illustrate the above information. (4)

2.2.3 Determine the probability of a learner taking:

(a) Economics and Mathematics. (2)

(b) At least ONE of the two subjects. (2)

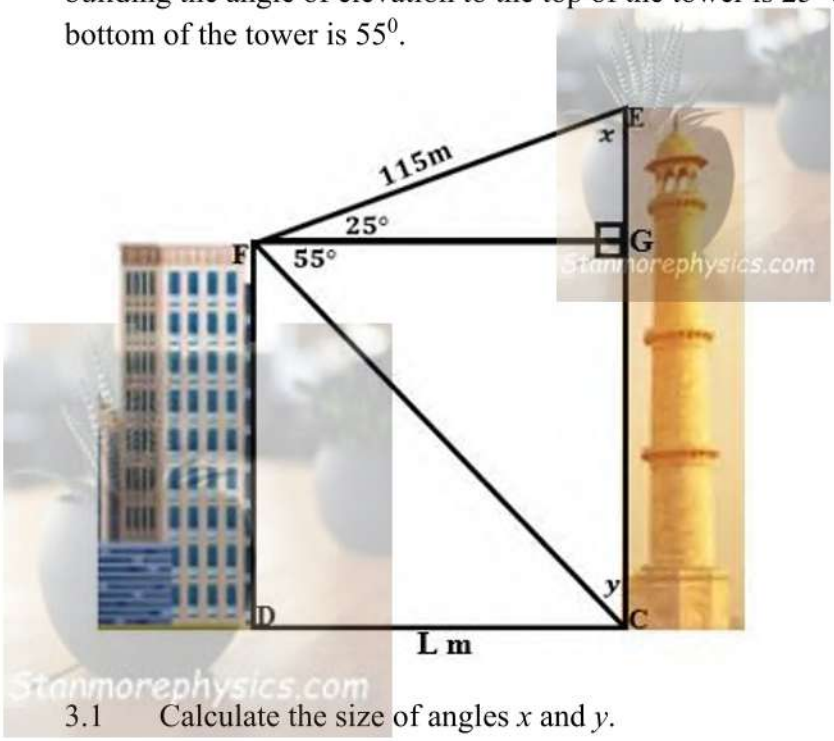
(c) Taking EXACTLY ONE subject. (2)

2.2.4 The probability that a Mathematics learner is also a Physical Sciences learner is 79%. Determine the number of learners that take Physical Sciences. (3)

[22]

QUESTION 3

A building and a tower are **L** meters apart in a horizontal plane. From the roof top of the building the angle of elevation to the top of the tower is 25^0 and the angle of depression to the bottom of the tower is 55^0.



3.1 Calculate the size of angles x and y. (3)

3.2 Calculate L, the distance between the building and the tower. Correct to TWO decimal places. (4)

3.3 Hence, or otherwise calculate the height of the tower. (5)

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TOTAL: 50

JOHANNESBURG EAST DISTRICT

PLC COMMON PAPER

GRADE 10

MARKING GUIDELINE

MATHEMATICS

TERM 3

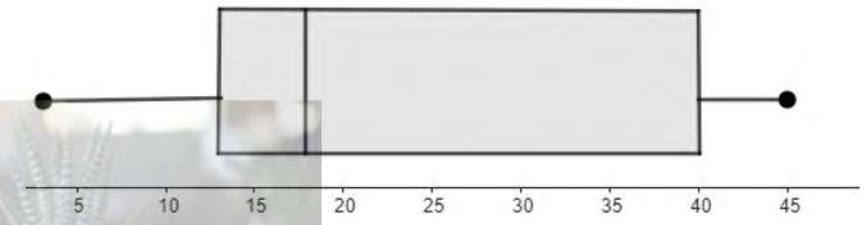
CONTROL TEST 2

DURATION: 1 HOUR

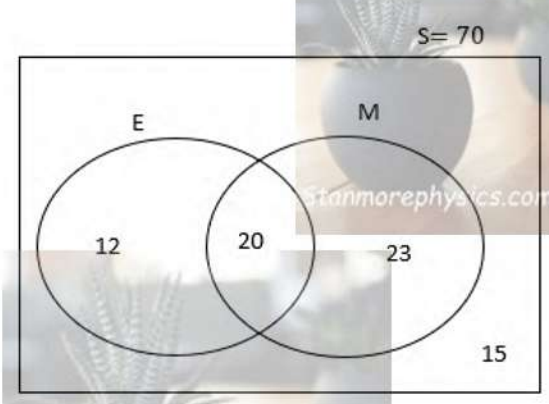
MARKS: 50

This Marking Guideline consists of 4 pages including the cover page.

QUESTION 1

1.1		
1.1.1	Range= $45-3=42$	✓ answer (1)
1.1.2	$\bar{x}=\frac{356}{15}=23{,}73$	✓ $\frac{356}{15}$ ✓ answer (2)
1.1.3	 Min Value = 3 Q_1=13 $Q_2=18$ $Q_3=40$ Max Value = 45	✓ Min & Max ✓ Q_1 ✓ Q_2 ✓ Q_3 (4)
1.1.4	The data is positively skewed, or the data is skewed to the right	✓ answer (1)
1.2.1	$200< x \leq 250$	✓ answer (1)
1.2.2	$100 < x \leq 150$	✓ answer (1)
1.2.3	Position $=\frac{30}{100}\times 120$ $=36^{th}$ position ∴ The 30^{th} percentile lies in the interval $50 < x \leq 100$	✓ $\frac{30}{100}\times 120$ ✓ answer (2)
1.2.4	Estimated mean$=\frac{(12\times25)+(38\times75)+(42\times125)+(20\times175)+(8\times225)}{120}$ $=\frac{13700}{120}$ $=114{,}17$	✓✓Numerator ✓13700 ✓answer (4)
		[16]

QUESTION 2

2.1.1	P (not B) = 0,5	✓ answer (1)
2.1.2	P (A or B) = P (A) + P (B) − P (A and B) =0,4 + 0,5− 0,25 = 0,65	✓ Formula ✓ Subst ✓ answer (3)
2.1.3	P ((not A) and B) = 0,5 - 0,25 = 0,25 Answer only full marks	✓0,5−0,25 ✓ answer (2)
2.2.1	$32-x+x+43-x+15=70$ $x = 20$	✓ $32-x+x+43-x+15$ ✓ equating to 70 ✓ answer (3)
2.2.2		✓ 12 ✓ 20 ✓ 23 ✓15 (4)
2.2.3	(a) P (E and M) = $\frac{20}{70} = \frac{2}{7} = 0,29$	✓✓ answer (2)
	(b) P (At least one) = $\frac{55}{70} = \frac{11}{14} = 0,79$	✓✓ answer (2)
	(c) P (Exactly one) = $\frac{12+23}{70} = \frac{35}{70} = \frac{1}{2} = 0,5$	✓✓ answer (2)
2.2.4	Physical science = $43 \times \frac{79}{100}$ = 33,97 ≈34 learners	✓43 ✓$\frac{79}{100}$ ✓ answer (3)
		[22]

QUESTION 3

3.1	$x + 25° + 90° = 180°$ sum of $\angle s$ in a Δ $\therefore x = 65°$ $y + 55° + 90° = 180°$ sum of $\angle s$ in a Δ $\therefore y = 35°$	✓ both S ✓ $x = 65°$ ✓ $y = 35°$ (3)
3.2	$\cos 25° = \frac{FG}{115}$ $FG = 104.23$ m but $FG = CD$ $\therefore L = CD = 104.23$ **OR** $\sin 65° = \frac{FG}{115}$ $FG = 104.23$ m but $FG = CD$ $\therefore L = CD = 104.23$	✓ $\cos 25°$ ✓ $\frac{FG}{115}$ ✓ Answer ✓ conclusion (4) **OR** ✓ $\sin 65°$ ✓ $\frac{FG}{115}$ ✓ Answer ✓ conclusion (4)
3.3	$\tan 55° = \frac{GC}{104.23}$ $GC = 148.86$ $\sin 25° = \frac{GE}{115}$ $GE = 48.60$ The height of a tower $GC + GE = 197.46$ **OR** $\tan 35° = \frac{104.23}{GC}$ $CG = 148.86$ $EG^2 + FG^2 = FE^2$ $EG^2 = (115)^2 - (104.23)^2$ $EG = \sqrt{2361.1071}$ $= 48.59$ The height of a tower $GC + GE = 197.45$	✓ subst in to correct ratio ✓ $GC = 148.53$ ✓ subst in to correct ratio ✓ $GE = 48.60$ ✓ $GC + GE = 197.46$ (5) **OR** ✓ subst in to correct ratio ✓ $GC = 148.86$ ✓Pyth theorem ✓ EG ✓ $GC + GE = 197.45$ (5)
		[12]

Total: 50