



Province of the
EASTERN CAPE
EDUCATION

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REPUBLIC OF SOUTH AFRICA

CHIEF DIRECTORATE – CURRICULUM MANAGEMENT

**GRADE 12 LEARNER SUPPORT
PROGRAMME**

**REVISION AND REMEDIAL TEACHING
INSTRUMENT:
ANSWERS**

SUBJECT: MATHEMATICS – THIRD PAPER

June 2009

This document consists of 8 pages.

Strictly not for test/examination purposes

QUESTION 1

- 1.1 $T_{n=1} = \frac{1}{4}T_n$ and $T_1 = \frac{1}{2} \rightarrow \frac{1}{2}; \frac{1}{8}; \frac{1}{32}$ (2) ✓✓ for first three terms
- 1.2 5 ; 8 ; 13 ; 21 ; ... ✓for sequence
 $T_n = T_{n-1} + T_{n-2}$ or $T_{n+2} = T_{n+1} + T_n$ ✓✓for recursive formula
 (3)
[5]

QUESTION 2

- 2.1 Cellphone company A = R 2,57
 Cellphone company B = R 2,60
 Cellphone company A offers better value for money. (2) ✓both averages
 ✓conclusion
- 2.2 Cellphone company A = R 2,72
 Cellphone company B = R 2,72
 The tariffs of the two cellphone companies are the same. (2) ✓✓ correct
 explanation
- 2.3 If the tariffs of the new cellphone company are the same or more expensive, the subscribers will remain. If the tariffs offer better value for money, subscribers will join new company. (2) ✓✓ conclusion
ANY CONCLUSION BY CANDIDATE THAT MAKES SENSE.
[6]

QUESTION 3 NOTE: According to the NCS the solutions to data-handling problems should be done with the use of a calculator. The alternative is to use the pen and paper method as indicated below.

3.1

Speed interval (km/h)	Midpoint of interval (x)	Frequency (f)	$f \times x$	$(x - \bar{x})^2$	$f \times (x - \bar{x})^2$
98 – 102	100	3	300	184,96	554,88
103 – 107	105	9	945	73,96	665,64
108 – 112	110	14	1540	12,96	181,44
113 – 117	115	9	1035	1,96	17,64
118 – 122	120	9	1080	40,96	360,64
123 – 127	125	2	250	129,96	259,92
128 – 132	130	2	260	268,96	537,92
133 – 137	135	2	270	457,96	915,92
SUM	→	50	5680		3494

$$\begin{aligned}
 3.1.1 \quad \text{Mean} &= \frac{\sum (f \times x)}{n} \\
 &= \frac{5680}{50} \\
 &= 113,6
 \end{aligned}$$

(2) ✓ substitution
✓ answer (CA)

$$\begin{aligned}
 3.1.2 \quad \text{Standard deviation} &= \sqrt{\frac{\sum f \times (x - \bar{x})^2}{n}} \\
 &= \sqrt{\frac{3494}{50}} \\
 &= 8,4
 \end{aligned}$$

(2) ✓ substitution
✓ Standard deviation

3.1.3 Interval [105,2; 122]
: 34 cars

(2) ✓✓ answer

3.2 3.2.1 26 cars (accept 26 – 28)

(2) ✓✓ answer

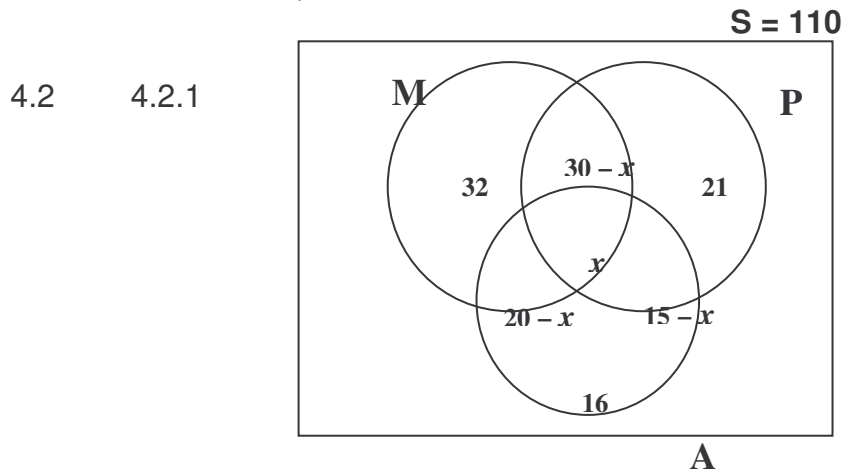
3.2.2 Approximately 60 km/h
(accept: answer between 59 – 61 km/h)

(2) ✓✓ answer

- 3.3 3.3.1 Not much change.
Only increase from 30% to 33%. (2) ✓ statement
✓ reason
- 3.3.2 That there is a steep increase in popularity.
Achieved by large vertical scale. (2) ✓ statement
✓ explanation
- 3.3.3 Using graph to create false impression and can
discourage voters or can fool voters. (2) ✓ ✓ answer
[16]

QUESTION 4

- 4.1 4.1.1 P(Kwesi passes and Emma fails)
 $= 0,8 \times 0,1$
 $= 0,08$ (1) ✓ 0,1
✓ answer
- 4.1.2 P(only one of Kwezi or Emma passes) =
(Kwezi passes and Emma fails OR Emma
passes and Kwezi fails)
 $= 0,08 + 0,9 \times 0,2$
 $= 0,08 + 0,18$
 $= 0,26$ (3) ✓ “+”
✓ $0,9 \times 0,2$
✓ answer



- 4.2.2 $32 + 30 - x + 21 + 20 - x + x + 15 - x + 16 = 110$
 $-2x = 110 - 134$
 $-2x = -24$
 $x = 12$ (2) ✓ Equation
✓ Answer
- 4.2.3 $P(\text{not } A, M \text{ and } Ph) = \frac{18}{110}$ (3) ✓ ✓ ✓ Answer

4.2.4 $P(A) \times P(Ph) = \frac{39}{110} \times \frac{54}{110} = 0,174$

$P(A \text{ and } Ph) = \frac{15}{110} = 0,136$

Conclusion: not independent events/answers different

✓ calculation and answer

✓ calculation and answer

✓ conclusion

(3)

4.3 4.3.1 $2 \times 3 = 6$ combinations

(1) ✓ answer

4.3.2 $P(\text{wearing something blue}) = \frac{4}{6}$

(2) ✓✓ answer

[19]

QUESTION 5

5.1 5.1.1

Mass (in grams)	10	50	100	150	200
Length of spring (in cm)	18	20	22,2 (22)	23,8 (24)	26,2 (26)

(1)

✓ completing the table (accept values in brackets)

5.1.2 Equation: $y = 17,75 + 0,042x$
(Accept variations due to different values in 5.1.1 – CA)

(4)

✓✓ a or b
✓ a or b
✓ equation

5.1.3 Positive, strong

(2)

✓ positive / ✓ strong

5.1.4 Length of spring = 23 cm

(1)

✓ answer

5.1.5 $r = 0,998$ (using calculator)

(3)

✓✓✓ answer
CA applies

5.2. Option 2 best describes the relationship between the max temperature and electricity used because $r^2 = 0,978$ is closer to 1.

(3)

✓ option 2
✓✓
explanation

[15]

*** FOR QUESTIONS 6 TO 9 FOLLOW CANDIDATE’S REASONING ***

QUESTION 6

- 6.1 $\hat{A}_1 = \hat{C}$ (*alt \angle 's : AP // BC*) ✓✓statement
& reason
 $\hat{A}_1 = \hat{A}\hat{B}\hat{C}$ (*Tan – Chord – Thm*)
 $\therefore \hat{C} = \hat{A}\hat{B}\hat{C}$ ✓✓statement
& reason
 $\Rightarrow \Delta ABC$ is an isosceles triangle (*base \angle 's =*) ✓ conclusion
- (5) [5]

QUESTION 7

- 7.1 $MN^2 = (x)^2 + (10-x)^2$ ✓substitution
 $= x^2 + 100 - 20x + x^2$
 $= 2x^2 - 20x + 100$ (2) ✓answer
- 7.2 $EP^2 = (10-x)^2 + (5-x)^2$ ✓ (5 – x)
 $= 100 - 20x + x^2 + 25 - 10x + x^2$
 $= 2x^2 - 30x + 125$ (2) ✓answer
- 7.3 $2x^2 - 20x + 100 = 2x^2 - 30x + 125$ ✓statement
 $10x = 25$
 $x = 2,5$ units (2) ✓answer
- [6]

QUESTION 8

- 8.1 $\hat{Y}_1 = x$ (*Tan – Chord – Thm*) ✓statement
 $\hat{X} = x$ (*Isosceles triangle*) ✓reason
 $\hat{Q} = x$ (*Alternate \angle 's*) ✓statement
 $\hat{Y}_2 = x$ (*\angle 's on same chord*) ✓statement
- (6) ✓reason
- 8.2 $\hat{T}_2 = \hat{Y}_1 + \hat{Y}_2$ (*Alternate \angle 's*) ✓statement
 $= x + x$ ✓substitution
 $= 2x = 2\hat{T}_1$ (3) ✓conclusion

- 8.3 $P\hat{T}Q = 3x = 90^\circ$ (\angle in semi – circle)
 $x = 30^\circ$ ✓ statement
 $\Rightarrow \hat{T}_1 = 30^\circ$ (2) ✓ answer
- 8.4 $\hat{S}_4 = \hat{X} + X\hat{Y}S$ ✓ $\hat{S}_4 = 90^\circ$
 $= 30^\circ + 60^\circ = 90^\circ$
 $\hat{R}_1 = 90^\circ$ ($Co - Interior \angle$'s : $XY \parallel TR$) ✓ $\hat{R}_1 = 90^\circ$
 $\therefore SORT$ is a cyclic quad. ($Ext. \angle = opp. int \angle$) (3) ✓ conclusion
- 8.5 $OR \perp TQ$ ($\hat{R}_1 = 90^\circ$)
 $\Rightarrow TR = RQ$ (line from centre of circle
perpendicular to chord, bisects the chord.) (3) ✓ statement
✓ conclusion
[17]

QUESTION 9

- 9.1 In $\triangle SRQ$ and $\triangle QRM$
 $\hat{Q}_1 = \hat{M}$ [$\hat{Q}_1 = \hat{T}$ ($alt. \angle$'s) & ✓ statement
 $\hat{T} = \hat{M}$ (\angle 's subtended by same chord) ✓ reason
 \hat{R} is common
 $\hat{S}_1 = \hat{M}\hat{Q}R$ [$Third \ angle$]
 $\triangle SRQ \parallel \triangle QRM$ (\angle, \angle, \angle) (4) ✓ statement
or
conclusion
(A,A,A)
- 9.2 In $\triangle QRM$ and $\triangle PXM$
 \hat{M} is common.
 $\hat{R} = \hat{X}_3$ ($corresponding \angle$'s; $PT \parallel QR$) ✓ statement
 $\therefore \triangle QRM \parallel \triangle PXM$ (\angle, \angle, \angle) (3) ✓ statement
✓ reason

9.3

From 9.1 it follows that $\frac{QR}{RM} = \frac{SR}{QR}$

$$QR^2 = SR \times RM$$

$$\text{In } \triangle MRQ; \frac{RM}{MX} = \frac{QR}{PX} \Rightarrow RM = \frac{MX \times QR}{PX}$$

$$\therefore QR^2 = SR \times \frac{MX \times QR}{PX}$$

$$\Rightarrow QR = \frac{SR \times MX}{PX}$$

✓ statement
 ✓ statement
 ✓✓
 simplification
 ✓ substitution

Note NO
 MARK for
 answer, since
 it is given.

(5)

[12]**TOTAL: 100**