Province of the
EASTERN CAPE
EDUCATION

CHIEF MARKER'S REPORT

SUBJECT:	MATHEMATICS P3

ANALYSIS OF QUESTION BY QUESTION PERFORMANCE

QUESTION 1

This question was fairly straight forward. Many learners scored some marks in this question. The fact that, questions 1.2 and 1.3 were dependent on question 1.1 and consistent accuracy marking was applied was to the advantage of the candidates. Some learners were caught out by statement 4 ("21 learners do not eat fish") because they forgot about the 2 that do not eat any of the three foods
I think it was quite a good question. It also tested the learners understanding of words like "and" , "any" etc. The use of the word "any" was confusing to many learners. Does it mean two only or does it include three? Is there a difference between "any two" and "at least two"?

QUESTION 2

This was also a fairly easy question. Since this was an open-ended question, learners did quite well in this question. Candidates were required to give motivations and recommendations. This was a good test of their general knowledge, insight and understanding into the real-life situation/scenario. Most candidates saw the connection between the given information and the questions and knew that they had to use the 78% and not the 90% in question 2.1.Candidates should be taught that understanding the context is important. They should base their motivations (in most cases) on the given context instead of giving general answers.

QUESTION 3

Another routine question. Learners who knew the normal distribution curve did well in this question. Question 3.1 was straight forward. Candidates had to use the fact that 34% + 34% = 68% lies between -1σ and $+1\sigma$ of the mean. In question 3.2 the word/term ***range*** caused some confusion amongst candidates. Range in a function context refers to an interval (all the values from the lowest to the highest value),

whereas in statistics it refers to the difference between the highest and the lowest values. It should be stressed that 3 standard deviations are used to determine the range as approximately 99.7% of the data falls within this range. ***Most candidates used the latter***. The fact that the standard deviation was a fraction didn't seem to be too much of a problem to the candidates.
No mention that the data is normally distributed could have been problematic.

QUESTION 4

This question was very well answered. Many candidates (who were taught) scored full marks in this question. Previously this question was poorly answered due to a lack of calculator usage. The majority of the candidates, even the weaker ones, plotted the points correctly. It was clear that most centres are using the calculator rather than the pen and paper method which is time consuming and candidates can easily make mistakes as there are many calculations involved. Questions were straight forward, testing the understanding of scatter plots as well as calculator usage. Candidates should make sure that they have entered the data 100% correctly as this would affect the answers. Note that the "line of best-fit" and "the least squares line" different. The former is an approximate line, while the latter is an exact line. The equation of the least squares line should be used to draw it when required. Some candidates in question 4.5 substituted the 86 in the place of x instead of y, showing the lack of understanding of function values.

QUESTION 5

Most textbooks have the number plate question. It was clear that candidates either knew what to do or not. Candidates should have seen similar questions before. It is a good question because candidates can relate to it since it involves a real-life scenario. Most candidates knew that they had to work with 21 letters and 10 numbers. While this question was fairly well answered, quite a few struggled with question 5.3 forgetting that to multiply by 3, ie [(1x9x9) + (9x1x9) + (9x9x1)].
Candidates should be clear on how the question differs if repetition is not allowed.
Note the difference between a permutation and a combination.

QUESTION 6

A good combination of recursive sequences and how it relates to other sequences. Most candidates did well in this question.

Question 6.1 was well answered. Some candidates made a slight error in finding the sequence by substituting the wrong value for k and ended up with 3; 0; -7; -18. They actually substituted the value of (k+1).

Question 6.2 was also well answered. Most candidates used their P1 knowledge to determine what type of sequence it was. It should however be noted that whilst there are sequences that can only be expressed by recursive formulae eg. Fibonacci, there are also sequences (linear, quadratic, etc sequences) that can be expressed by an explicit formula as well as a recursive formula.

QUESTION 7

Since very few candidates wrote P3, mostly prepared candidates, this question was fairly well answered. Many different ways of answering the geometry questions is to the advantage of the candidates. Markers follow candidate's argument/steps. Some candidates still assumed some vital information without evidence which actually makes the question easier. For eg. AB = AD. Many candidates still have problems in writing out the solution in steps, although they are able to show it on the sketch.

QUESTION 8

It is real good to see formal proofs back. Bookwork allows candidates to score some marks in geometry. Where candidates were exposed to the proofs of theorems they had absolutely no problem in answering question 8.1 and bagging the 5 marks. It was clear though that in some centres proofs are still not being taught. There are various different proofs that can be used.

Although many candidates did well in 8.2.1, many could not see that $\hat{A} = \hat{B}_4$ (corresponding angles : BD//AO) and simply wrote that $\hat{A} = \hat{E}$ (same chord). Again they just assumed that ABOE was a cyclic quadrilateral even though angle A lies outside and not on the circumference of the circle.

Candidates struggled with question 8.2.3. Wrong use of congruency (S,S, A).

QUESTION 9

Most candidates struggled with this question. The fact that one piece of information was omitted made the question very tough. This could be seen as the only unfair question in the question paper. The better candidates who attempted this question knew that they had to prove similarity first. Some candidates still write similar triangles in the wrong order affecting further calculations.

QUESTION 10

This question was well attempted, especially 10.1. Candidates must be taught to always give reasons in geometry, even if it is when they are using the Theorem of Pythagoras. Candidates were able to write down the separate statements that were needed, but in some cases failed to bring them together losing the final mark. Question 10.3 was also a challenge to most candidates, failing to see the connection with previous question or they even struggled to solve it using separate triangles.

7. ANY ADVICE THAT YOU COULD GIVE TO EDUCATORS TO HELP LEARNERS TO REACH THE EXPECTED LEVELS

Make learners aware of the advantages of doing Paper 3. Get information from Tertiary institutions in this regard.
Learners should be given sufficient practice examples and revision, especially in the Geometry section.
Also show learners that sometimes there are different ways of obtaining the solutions. Geometry is a classic example that lends itself to this.
As in most cases learners must read and understand the question, before they answer it.
Geometry also allows learners to be creative and come up with their own solutions.
The paper is not difficult at all. Learners will however have to set aside some extra time to be able to fit this in.
Teach the basics and then PRACTICE, PRACTICE AND MORE PRACTICE.

8. ANY OTHER COMMENTS

N.B – Clear direction regarding crossed-out working should be given. Different cases should be discussed with learners.

The sketch for 8.2 could have been a little bigger.

Diagram sheets should be collected even if they were not used by candidates, because some candidates answered the geometry but did not hand in their diagram sheets which made it very difficult to follow the candidates attempted solution in marking and award marks.

Diagrams on the diagram sheet must be large enough and clear. In this paper diagram for question 9 could have been shifted to Page 2 with question 10 diagram and the diagram for question 8.2 could have been drawn larger.

All schools, not necessarily all learners, should attempt Mathematics P3 next year since these topics will most probably be divided into paper 1 and paper 2. See draft CAPS.
The CAPS/Examination guidelines should be clear regarding the proofs of theorems.
Plans to motivate educators and learners to do this subject should be put in place, in preparation of future implementation of this content.
Learners should get sufficient practice in all the different ways questions can be asked on a certain topic. Learners should also be taught different methods to solve problems. The use of the calculator should be emphasized in the Data Handling questions. Learners should really be drilled to know the Geometry Theorems and practice the application thereof.
How about making a Mathematics Answer book with the diagrams at the appropriate question, this will eliminate the problem of candidates not handing in diagram sheets, as well as help in the marking process.
Principals and Educators should not register learners for this paper if they are not taught the content. It is not a higher level of paper 1 and 2, but totally different.