**education**

Department:
Education
North West Provincial Government
**REPUBLIC OF SOUTH AFRICA**

**PROVINCIAL ASSESSMENT**

**GRADE 10**

**MATHEMATICS P2**

**NOVEMBER 2024**

**MARKS: 100**

**TIME: 2 hours**

**This question paper consists of 10 pages, and a 13-page answer book.**

**INSTRUCTIONS AND INFORMATION**

1.      This question paper consists of SEVEN questions.

2.      Answer ALL questions in the SPECIAL ANSWER BOOK provided.

3.      Clearly show ALL your calculations, diagrams, graphs, etc that you have used to
        determine the answer.

4.      Answers only will NOT be necessarily awarded full marks.

5.      If necessary, round off answers to TWO decimal places, unless stated otherwise.

6.      Diagrams are NOT necessarily drawn to scale.

7.      You may use an approved scientific calculator (non - programmable and
        non - graphical), unless stated otherwise.

8.      Write neatly and legibly.

## QUESTION 1

Mr Baloyi conducted a survey on the amount of airtime (in Rands) EACH learner had on his or her cellphone.

| 12 | 16 | 20 | 22 | 26 | 30 | 32 | 38 | 40 | 46 | 54 | 60 | 68 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|

| 1.1 | Draw a box and whisker to represent the data. | (3) |
|-----|-----------------------------------------------|-----|
| 1.2 | Determine the interquartile range (IQR). | (2) |
| 1.3 | Calculate the range of the data. | (2) |
| 1.4 | Comment on the skewness of the data. | (1) |

**[8]**

## QUESTION 2

The histogram below shows the distribution of examination scores for learners in Introductory stats.
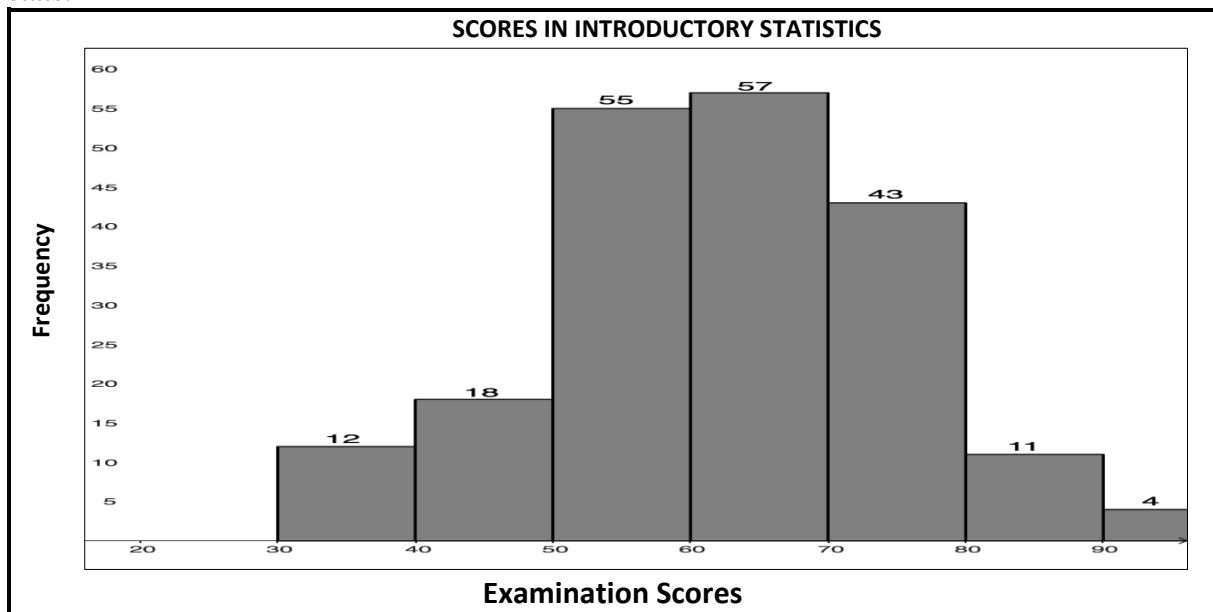


| 2.1 | How many learners wrote the examination? | (1) |
|-----|------------------------------------------|-----|
| 2.2 | Identify the modal class of the data. | (1) |
| 2.3 | Estimate the mean of this data. Show all calculations. | (4) |
| 2.4 | Estimate the median mark obtained by the group. | (2) |
| 2.5 | In which interval does the upper quartile lie? | (1) |

**[9]**

## QUESTION 3

In the figure, $\triangle ABC$ has vertices A(-11;2), B(3;-5) and C(6;1).
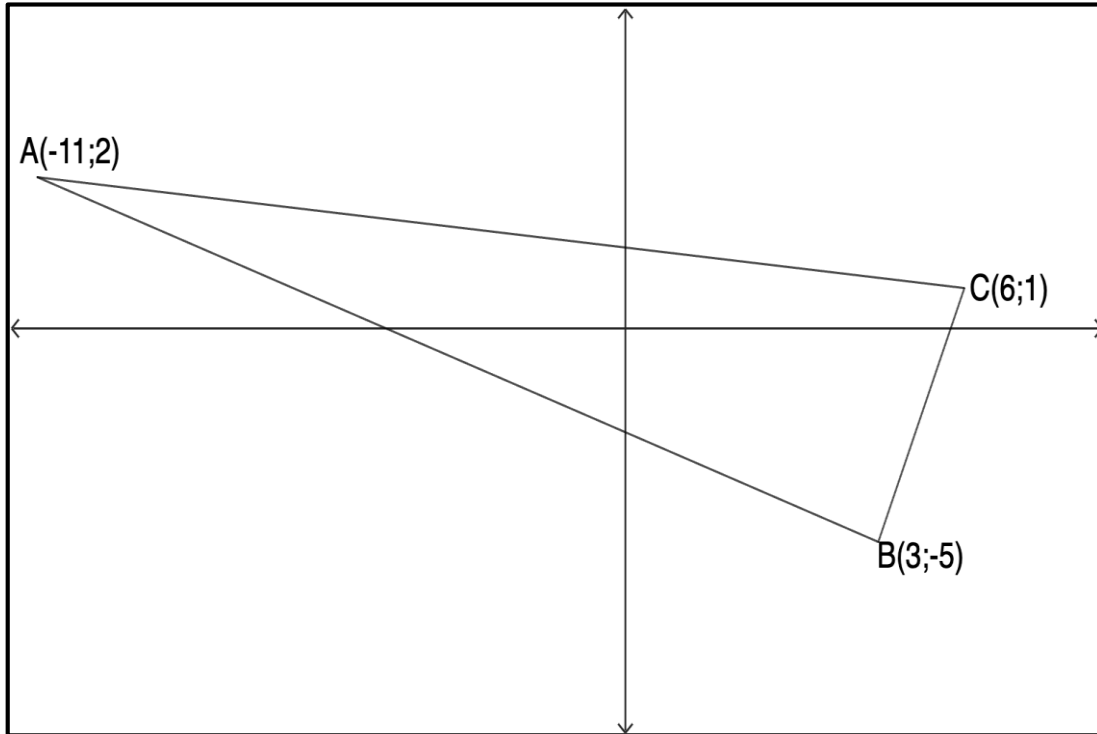


3.1          Calculate the length of BC. Leave the answer in  surd form.                    (2)

3.2          Write down the coordinates of the midpoint D, of AB.                             (4)

                                                                                             (5)
3.3          Prove that $A\hat{B}C = 90°$.

3.4          Calculate the area of $\triangle ABC$.
                                                                                             (4)
                                                                                    **[15]**

**QUESTION 4**

In the diagram is a right-angled triangle has sides *a, b* and *c* and the $\hat{B} = 90°$ .
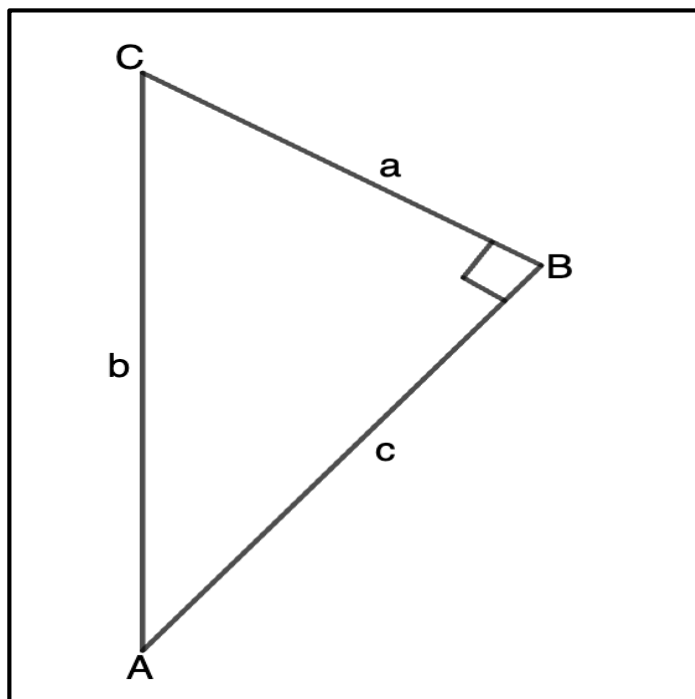


4.1     Write down the following in terms of *a, b* and *c.*

     4.1.1     $\sin A$     (1)

     4.1.2     $\cot C$     (1)

     4.1.3     If it is given that a = 5 and A =50, calculate the numerical value of c.     (3)

4.2     Given: $13\cos\theta = 12$, where $0° \leq x \leq 90°$ ,**without using a calculator,** use a sketch to determine the following.

     4.2.1     $\sin\theta$     (4)

     4.2.2     $\tan\theta - \operatorname{cosec}^2\theta$     (3)

4.3     Simplify, **without the use of a calculator.**

     $\operatorname{cosec}60°.\cot30° + \cos45°.\operatorname{cosec}45°.$     (5)

4.4     Solve for *x,* correct to two decimal places:

     $3 + \sec x = 5$ and $0° \leq x \leq 90°$     (3)

     **[20]**

**QUESTION 5**

In the diagram below, the graphs of $f(x) = \cos x + a$ and $g(x) = b \sin x$ are drawn for $x \in [-180°; 180°]$.
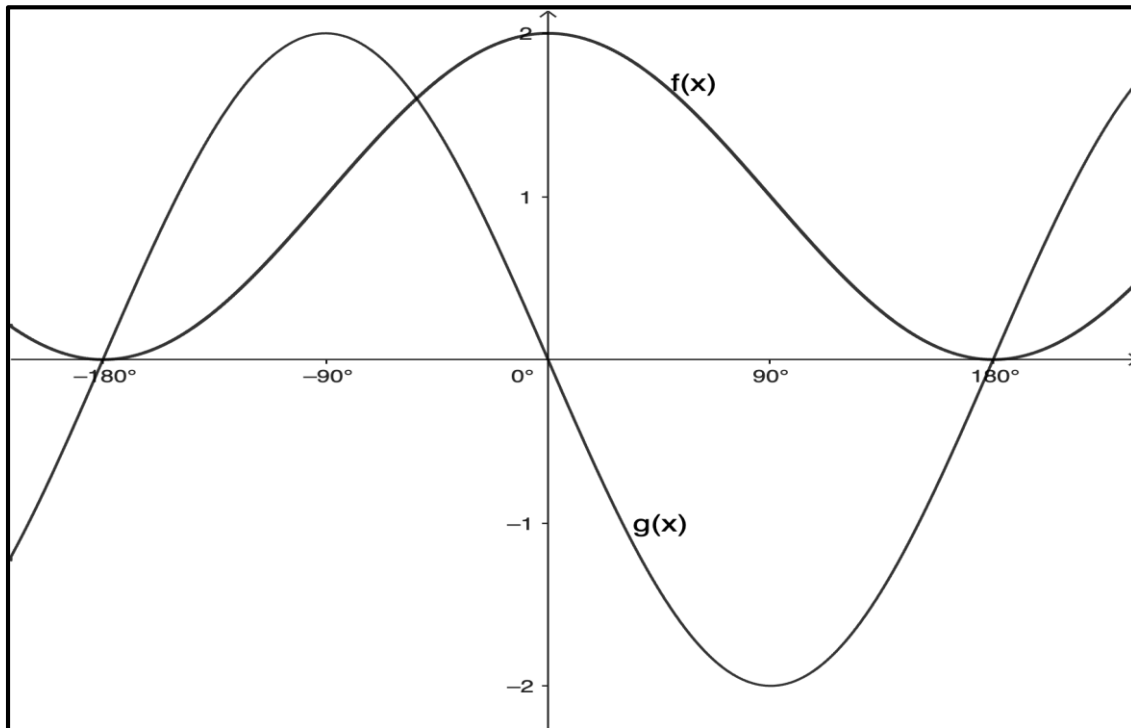


5.1    Write down the values of *a* and *b*. (2)

5.2    Write down the period of *g*. (1)

5.3    Determine the range of *f*. (2)

5.4    Write down the amplitude of *g*. (1)

5.5    Determine the number of solutions to $f(x) = g(x)$ for $-180° < x < 180°$. (1)

5.6    For which values of x is $g(x) < 0$. (2)

5.7    The graph of $f$ is reflected about the *x*-axis and then moved 2 units downwards to form the graph of h.
Determine:

5.7.1    The equation of *h* (2)

5.7.2    The range of *h* (2)

**[13]**

**QUESTION 6**

An observer on the top of a cliff, 200 m above the sea level, observes the angles of depression of the two ships to be 45° for ship A, and 30° for ship B, as shown below.
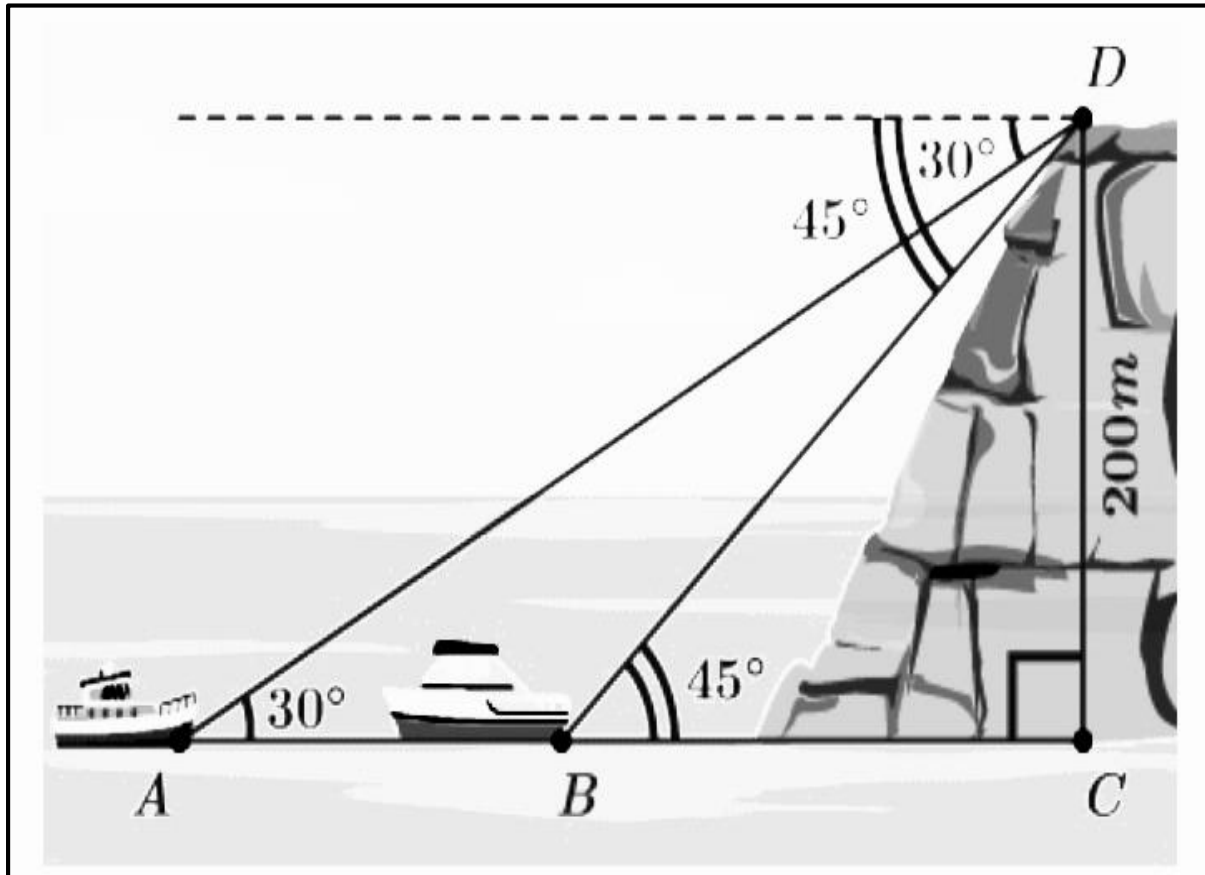


6.1     Determine the size of $B\hat{D}C$.                                                          (2)

6.2     Calculate the length of BC.                                                                (2)

6.3     Determine the distance between Ship A and Ship B.                       (4)

                                                                                                              **[8]**

**QUESTION 7**

Given the rectangular prism below:

$V = L.B.H$
$SA = 2(L.B) + 2(L.H) + 2(H.B)$



5 m

3 m

8 m
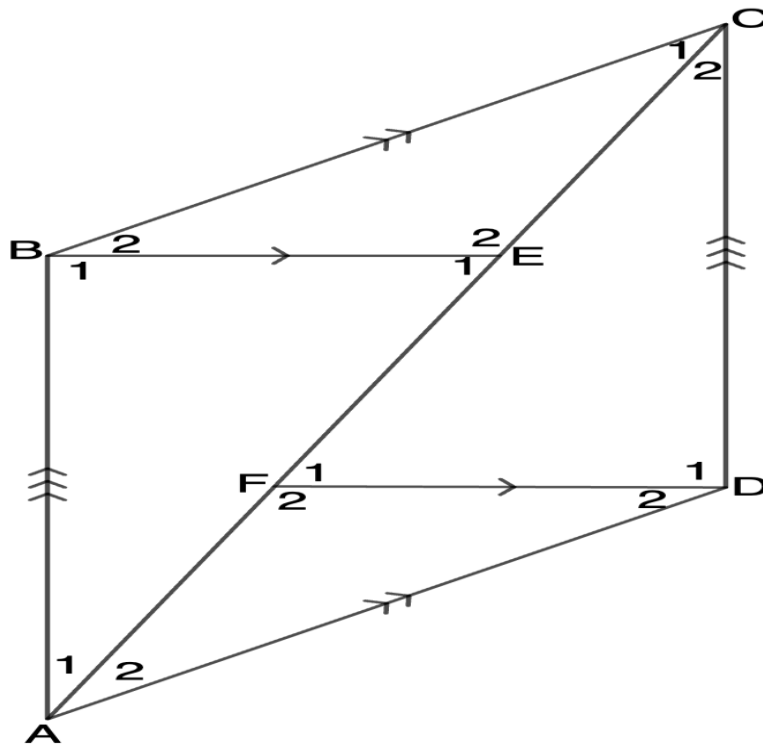
7.1     Calculate the surface area of the prism.                                                         (2)

7.2     Calculate the volume of the prism if the height is doubled and the                    (2)
          breadth halved.

7.3     Calculate the volume if the length is doubled, the height is halved and the
          breadth is tripled.                                                                                         (3)

**[7]**

**Give reasons for ALL geometry statements used in QUESTION 8 and 9.**

**QUESTION 8**

ABCD is a parallelogram and AC is a diagonal,with A,F,E and C as colinear points.



8.1     Prove that:

        8.1.1   ΔABE ≡ ΔCDF                                                          (4)


        8.1.2                                                                        (3)
                 $\overset{\wedge}{CEB} = \overset{\wedge}{AFD}$

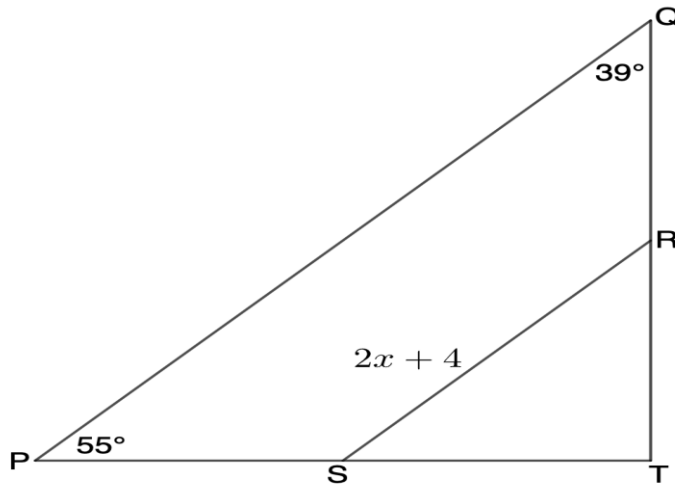        8.1.3   AF = CE                                                              (3)
                                                                                    **[10]**

**QUESTION 9**

In the diagram below, R is the midpoint of QT and S is the midpoint of PT. The length of SR is  $2x + 4$. $\hat{Q} = 39°$  and  $\hat{P} = 55°$.



9.1    Determine the length of PQ in terms of *x*.                                    (2)

9.2    If the length of PQ is 18, determine the value of *x*.                       (3)

9.3    Prove that  $\triangle TRS \;|||\; \triangle TQP$                                                   (5)

                                                                                        **[10]**

                                                        **TOTAL :**      **100**