



Access fun Grade 8–12 quizzes, matric past papers, K53 learner mock tests, and NBT prep!

All in one easy-to-use app.

DOWNLOAD GO STUDY NOW



Tap on the buttons above to download the app

 www.gostudy.club



Province of the
EASTERN CAPE
EDUCATION

**NASIONALE
SENIOR SERTIFIKAAT**

GRADE 10

NOVEMBER 2018

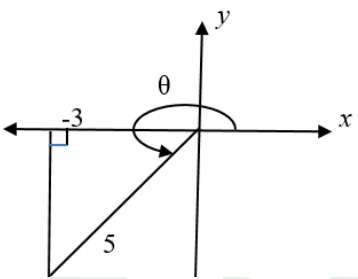
**TECHNICAL MATHS P2
MARKING GUIDELINE**

PUNTE: 100

This marking guideline consists of 11 pages.

| QUESTION 1 | | | |
|------------|--|--|-----|
| 1.1.1 | $M\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$ $\therefore M\left(\frac{2+0}{2}; \frac{-4+3}{2}\right)$ $\therefore M\left(1; -\frac{1}{2}\right)$ | ✓ Substitution ✓ Answer | (2) |
| 1.1.2 | $m_{MB} = \frac{y_2 - y_1}{x_2 - x_1}$ $\therefore m_{MB} = \frac{-\frac{1}{2} - (-1)}{1 - (-3)}$ $= \frac{-\frac{1}{2} + 1}{1 + 3}$ $\therefore m_{MB} = \frac{1}{8}$ | ✓ Substitution ✓ Answer | (2) |
| 1.1.3 | $m_{MB} = \frac{1}{8}$ $y = mx + c$ $-1 = \frac{1}{8}(-3) + c$ $\therefore c = -\frac{5}{8}$ $\therefore y = \frac{1}{8}x - \frac{5}{8}$ <p style="text-align: center;">OR</p> $y - y_1 = m(x - x_1)$ $y - (-1) = \frac{1}{8}(x - (-3))$ $y = \frac{1}{8}x + \frac{3}{8} - 1$ $\therefore y = \frac{1}{8}x - \frac{5}{8}$ | ✓ Substitution ✓ $c = -\frac{5}{8}$ ✓ Equation ✓ Substitution ✓ Simplification ✓ Answer | (3) |

| | | | |
|-------------|--|---|-----|
| 1.1.4 | $CD^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$ $5^2 = (k - 2)^2 + (0 - (-4))^2$ $5^2 = (k - 2)^2 + (0 + 4)^2$ $25 = (k - 2)^2 + 16$ $k^2 - 4k + 4 - 9 = 0$ $k^2 - 4k - 5 = 0$ $\therefore (k - 5)(k + 1) = 0$ $k = -1 \text{ or } k = 5$ $\therefore k = 5$ | ✓ Substitution ✓ Standard form ✓ Factors ✓ Answer | (4) |
| 1.1.5 | $BC = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $\therefore BC = \sqrt{(2 - (-3))^2 + (-4 - (-1))^2}$ $\therefore BC = \sqrt{34}$ $AD = \sqrt{(5 - 0)^2 + (0 - 3)^2}$ $\therefore AD = \sqrt{34}$ $\therefore BC = AD = \sqrt{34}$ $\Rightarrow BC = AD$ $\therefore ABCD$ is a parallelogram (Opp. sides of quad are equal) OR $m_{BC} = -\frac{3}{5}$ $m_{AD} = \frac{0 - 3}{5 - 0}$ $\therefore m_{AD} = -\frac{3}{5} = m_{BC}$ $\therefore BC \parallel AD$ $m_{AB} = \frac{3 - 1}{0 - 3} = \frac{2}{-3} = -\frac{2}{3}$ $m_{DC} = \frac{0 - 4}{5 - 2} = \frac{-4}{3} = -\frac{4}{3}$ $m_{AB} = m_{DC} = -\frac{2}{3}$ $\therefore AB \parallel DC$ $\therefore ABCD$ is a parallelogram (Opp. sides of quad are parallel) | ✓ BC ✓ AD ✓ BC = AD ✓ Conclusion $\checkmark m_{AD} = m_{BC} = -\frac{3}{5}$ $\checkmark m_{AB} = m_{DC} = -\frac{2}{3}$ ✓ AB // DC ✓ Conclusion | (4) |
| [14] | | | |

| QUESTION 2 | | | |
|------------|--|---|-----|
| 2.1.1 | $\operatorname{cosec} A + \cot B$ $= \frac{1}{\sin A} + \frac{1}{\tan B}$ $= \frac{1}{\sin 57^\circ} + \frac{1}{\tan 39^\circ}$ $= 2.43$ | ✓ Reciprocals ✓ Substitution ✓ Answer | (3) |
| 2.1.2 | $2 \cos \frac{3A}{2}$ $= 2 \cos \frac{3(57^\circ)}{2}$ $= 0.16$ | ✓ Substitution ✓ Answer | (2) |
| 2.2.1 | $5 \cos \theta = -3$ $\cos \theta = -\frac{3}{5}$  $r^2 = x^2 + y^2$ $5^2 = (-3)^2 + y^2$ $y^2 = 25 - 9$ $= 16$ $\therefore y = -4$ $\cos \theta + \tan \theta$ $= \frac{-3}{5} + \left(\frac{-4}{-3} \right)$ $= -\frac{3}{5} + \frac{4}{3}$ $= \frac{11}{15}$ | ✓ Correct Diagram ✓ $y = -4$ ✓ Substitution ✓ Answer | (4) |

| | | | |
|-------------|--|---|-----|
| 2.2.2 | $\sec \theta = \frac{r}{x}$ $\sec \theta = \frac{5}{-3}$ $\therefore \sec \theta = -\frac{5}{3}$ <p style="text-align: center;">OR</p> $\sec \theta = \frac{1}{\cos \theta}$ $= \frac{1}{-\frac{3}{5}}$ $\therefore \sec \theta = -\frac{5}{3}$ | $\checkmark \sec \theta = \frac{r}{x}$ $\checkmark \text{ Substitution}$ $\checkmark \text{ Answer}$ $\checkmark \text{ Reciprocal}$ $\checkmark \text{ Substitution}$ $\checkmark \text{ Answer}$ | (3) |
| 2.3 | $2 \tan(2x + 12^\circ) - 3 = 1$ $2 \tan(2x + 12^\circ) = 4$ $\tan(2x + 12^\circ) = 2$ $2x + 12^\circ = \tan^{-1}(2)$ $2x + 12^\circ = 63,43^\circ$ $2x = 63,43^\circ - 12^\circ$ $2x = 51,43$ $x = 25,72$ | $\checkmark \text{ Transposing 3}$ $\checkmark \tan(2x + 12^\circ) = 2$ $\checkmark \tan^{-1}(2)$ $\checkmark 2x = 51,43^\circ$ $\checkmark \text{ Answer}$ | (5) |
| [18] | | | |

| QUESTION 3 | | | |
|------------|--|---|-------------|
| 3.1 | $\hat{ABC} = 90^\circ$ ($AB \perp AD$) | ✓ Statement ✓ Reason | (2) |
| 3.2 | $\hat{DAC} + \hat{BAC} = 90^\circ$ ($AB \perp AD$) $\therefore \hat{BAC} = 49^\circ$ $\therefore \hat{ACB} = 41^\circ$ ($\angle \text{Sum of } \triangle ABC$) $\tan \hat{ACB} = \frac{AB}{BC}$ $\therefore AB = 45 \tan 41^\circ$ $\therefore AB = 39.12m$ $\therefore AB = 3912cm$ | $\checkmark \hat{BAC} = 49^\circ$ \checkmark Statement & Reason \checkmark Subst. into tan ratio \checkmark Answer | (4) |
| 3.3 | $\tan \hat{EAD} = \frac{ED}{AD}$ $\tan 73^\circ = \frac{ED}{45}$ $\therefore ED = 45 \tan 73^\circ$ $\therefore ED = 147.19m$ $\therefore ED = 14719cm$ | \checkmark Substitution \checkmark Simplification \checkmark Answer | (3) |
| 3.4 | $EC = CD + ED$ $CD = 45 \tan 41^\circ$ $\therefore CD = 39.12m$ $\therefore CD = 3912cm$ $\Rightarrow EC = 3912cm + 14719cm$ $\therefore EC = 18631cm$ | $\checkmark CD = 3912cm$ $\checkmark 3912cm + 14719cm$ \checkmark Answer | (3) |
| | | | [12] |

| QUESTION 4 | | | |
|------------|--|---|-------------|
| 4.1.1 | | <ul style="list-style-type: none"> ✓ x-intercepts ✓ y-intercepts ✓ asymptotes ✓ shape | (4) |
| 4.1.2 | Period is 180° | ✓✓ 180° | (2) |
| 4.1.3 | $y = -3\tan x$ | ✓ Answer | (1) |
| 4.2.1 | $g(x) = a \sin x$ $3 = a \cos 0^\circ$ $3 = a(1)$ $a = 3$ | <div style="border: 1px solid black; padding: 5px; display: inline-block;">Answer Only: full marks</div> <ul style="list-style-type: none"> ✓ Substitution ✓ Answer | (2) |
| 4.2.2 | Range is $-1 \leq y \leq 5$ | <ul style="list-style-type: none"> ✓ - 1 ✓ 5 | (2) |
| | | | [11] |

| QUESTION 5 | | | |
|------------|---|---|------------|
| 5.1.1 | $\widehat{PRS} = 30^\circ$ (Alt. \angle 's ; $PQ \parallel RS$) | ✓ Statement ✓ Reason | (2) |
| 5.1.2 | $\widehat{TRS} = 40^\circ$ (Corr. \angle 's ; $PQ \parallel RS$) | ✓ Statement ✓ Reason | (2) |
| 5.1.3 | $\widehat{P} + \widehat{Q} + \widehat{PRQ} = 180^\circ$ (\angle sum Δ) $30^\circ + 40^\circ + \widehat{PRQ} = 180^\circ$ $\widehat{PRQ} = 180^\circ - 30^\circ - 40^\circ$ $= 110^\circ$ | ✓ statement and reason. ✓ Answer | (2) |
| 5.1.4 | $\widehat{PRT} = \widehat{PRS} + \widehat{SRT}$ (Same \angle) $\widehat{PRT} = 30^\circ + 40^\circ = 70^\circ$ OR $\widehat{PRT} = \widehat{Q} + \widehat{P}$ (Ext. \angle of $\Delta =$ Sum of 2 opp.int. \angle) $\therefore \widehat{PRT} = 40^\circ + 30^\circ$ $\therefore \widehat{PRT} = 70^\circ$ | ✓ statement and Reason ✓ Answer | (2) |
| 5.1.5 | $\widehat{P} + \widehat{Q} = \widehat{PRT}$ (ext. $\angle =$ sum of 2 opp. Int. angles) OR \widehat{PRT} is an interior angle of triangle PQR , therefore \widehat{PRT} is the sum of \widehat{Q} and \widehat{P} (two opposite interior angles) | ✓ Reason ✓ Reason | (1) |
| | | | [9] |

| QUESTION 6 | | | |
|------------|--|---|------|
| 6.1 | ABDE is an Isosceles trapezium. Given one pair of sides to be equal and another parallel | ✓ Trapezium ✓ Equal pair ✓ Parallel pair | (3) |
| 6.2.1 | $\widehat{BAE} + \widehat{EDB} = 180^\circ$ (Opp \angle s of isosceles Trapezium) $2x + \widehat{EDB} = 180^\circ$ $\therefore \widehat{EDB} = 180^\circ - 2x$ | ✓ Statement and reason ✓ Answer | (2) |
| 6.2.2 | $\widehat{BAE} = \widehat{AED}$ (base \angle s of isosceles trapezium) $\widehat{AED} = 2x$ | ✓ Statement and reason ✓ Answer | (2) |
| 6.3 | $180^\circ - 2x = x$ (opp. \angle s of parm.) $3x = 180^\circ$ $\therefore x = 60^\circ$ | ✓ $180^\circ - 2x = x$ ✓ $x = 60^\circ$ | (2) |
| 6.4 | $\widehat{ACB} = \widehat{CAB}$ (Alt. angles AE//BD) Therefore, triangle ABC is isosceles Therefore, ABCE is a Rhombus (adjacent sides are equal, AB=BC) | ✓ Statement & reason ✓ Isosceles ✓ Conclusion ✓ Reason | (4) |
| | | | [13] |



| QUESTION 7 | | | |
|------------|--|--|-------------|
| 7.1.1 | Proof: In ΔPQO and MNO \hat{O} is common $\hat{OPQ} = \hat{OMN}$ (corr. angles $PQ \parallel MN$) $\hat{OQP} = \hat{ONM}$ (corr. angles $PQ \parallel MN$) $\Delta PQO \parallel \Delta MNO$ (AAA) | ✓ \hat{O} is common ✓ Statement & Reason ✓ Statement & Reason $\Delta PQO \parallel \Delta MNO$ (AAA) | (3) |
| 7.1.2 | $\frac{PQ}{MN} = \frac{QO}{NO} = \frac{PO}{MO}$ | ✓ Answer | (1) |
| 7.2.1 | $\frac{OQ}{OM} = \frac{PQ}{MN}$ ($\Delta PQO \parallel \Delta MNO$) $\frac{OQ}{12} = \frac{6}{9}$ $OQ = \frac{6}{9} \times 12$ $OQ = 8$ units | ✓ Statement and reason ✓ Simplification ✓ Answer | (3) |
| 7.2.2 | $\frac{PM}{OP} = \frac{MN}{PQ}$ $\frac{PM}{19} = \frac{9}{6}$ $PM = \frac{9}{6} \times 19 = \frac{57}{2} \approx 28,50$ units | ✓ $\frac{PM}{19} = \frac{9}{6}$ ✓ Simplification ✓ Answer | (3) |
| | | | [10] |

| QUESTION 8 | | | |
|------------|---|---|------------|
| 8.1.1 | $107.5^\circ = 107^\circ + 0.5 \times 60$ $= 107 + 30$ $= 107^\circ 30' 00''$ | ✓ Multiply by 60 ✓ 30' ✓ 00'' | (3) |
| 8.1.2 | $69^\circ 64' 89'' = 69^\circ + \frac{64}{60} + \frac{89}{60 \times 60}$ $= 69.1^\circ$ | ✓ ✓ Divide by 60 and 3600 ✓ Answer | (3) |
| 8.2 | $\theta = s/r$ $= \frac{35}{7} \times \frac{180}{\pi}$ $= 286.48^\circ$ | ✓ $\theta = s/r$ ✓ $\frac{35}{7}$ ✓ Multiply by $\frac{180}{\pi}$ ✓ 286.48 | (4) |
| 8.3 | $2\pi - \frac{\pi}{9} - 120^\circ$ $= \frac{17}{9}\pi - 120^\circ$ $= \frac{17}{9}\pi \times \frac{180}{\pi} - 120^\circ$ $= 340^\circ - 120^\circ$ $= 220^\circ$ | ✓ $\frac{17}{9}\pi$ ✓ Multiply by $\frac{180}{\pi}$ ✓ Answer | (3) |
| | | | [13] |
| | | TOTAL: | 100 |