



KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA



**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

**MATHEMATICS
COMMON TEST
SEPTEMBER 2022
MARKING GUIDELINE**

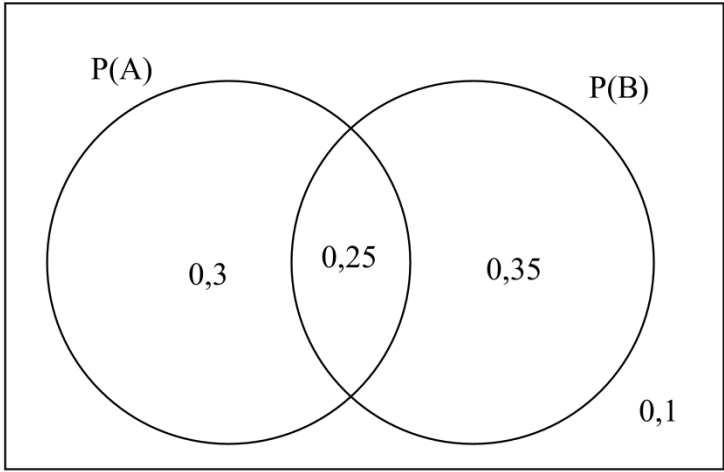
MARKS: 75

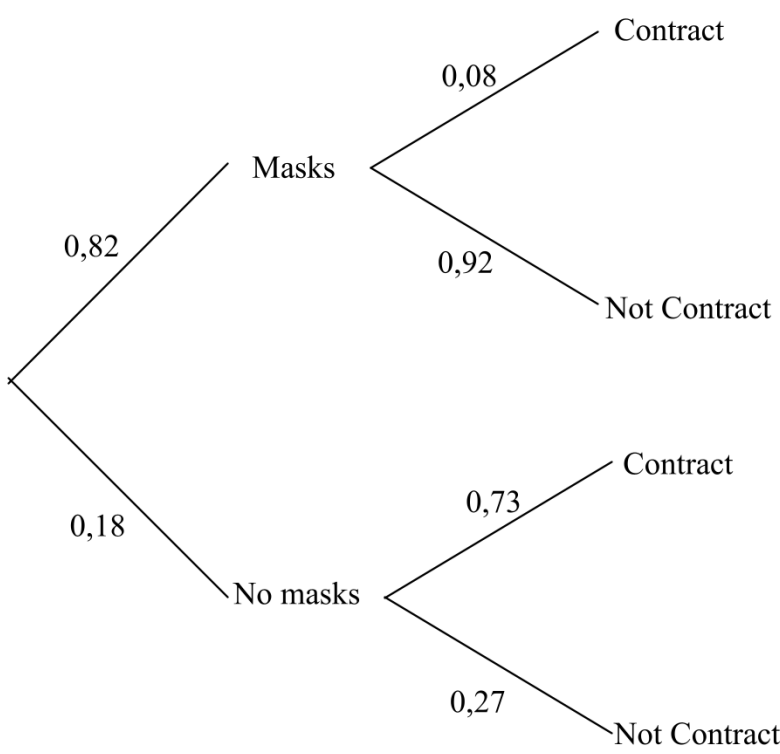


This marking guideline consists of 7 pages.


GRADE 11
Marking Guideline

QUESTION 1

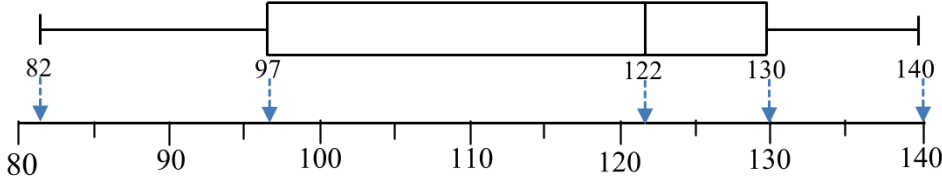
| | | |
|--------------|---|--|
| 1.1.1 (a) | $P(\text{older than 30 years}) = \frac{352}{560}$ $= 0,63$ <div style="border: 1px solid black; padding: 2px; display: inline-block;">Answer only: full marks</div> | ✓ 352 (as numerator) ✓ 560 (as denominator) (2) |
| 1.1.1 (b) | $P(\text{more than 2 accidents}) = \frac{99}{560}$ $= 0,18$ | ✓ answer ($\frac{99}{560}$ or 0,18) (1) |
| 1.1.1 (c) | $P(\text{older than 30 years and more than 2 accidents}) = \frac{48}{560}$ $= 0,09$ | ✓ 48 in numerator ✓ answer (2) |
| 1.1.2 | $P(\text{older than 30 years}) \times P(\text{more than 2 accidents})$ $= \frac{352}{560} \times \frac{99}{560}$ $= \frac{1089}{9800} \text{ or } 0,11$ $\therefore P(\text{older than 30 years}) \times P(\text{more than 2 accidents}) \neq P(\text{older than 30 years and more than 2 accidents})$ <p>Therefore: the events are not independent</p> | ✓ calculating $P(\text{older than 30 years}) \times P(\text{more than 2 accidents})$ ✓ reasoning ✓ conclusion (3) |
| 1.2.1 | <div style="text-align: right; margin-bottom: 5px;">$P(S)$</div>  | One mark each for the following values placed correctly: ✓ 0,3 ✓ 0,25 ✓ 0,35 ✓ 0,1 (4) |
| 1.2.2 | $P[\text{not}(A \text{ or } B)] = 0,1$ | ✓ 0,1 (1) |
| 1.2.3 | $P[A \text{ and } (\text{not } B)] = 0,3$ | ✓ 0,3 (1) |

| | | |
|-------------|---|---|
| 1.3 | <p>A tree diagram may be drawn to represent all the possible outcomes with their probabilities:</p>  <p> $P(\text{mask and contract}) + P(\text{no mask and contract})$ $= 0,82 \times 0,08 + 0,18 \times 0,73$ $= 0,20 \text{ or } 20\%$ </p> | <p>✓✓ $0,82 \times 0,08$ ✓✓ $0,18 \times 0,73$ ✓ answer after addition (accept 19,70%) (5)</p> |
| [19] | | |

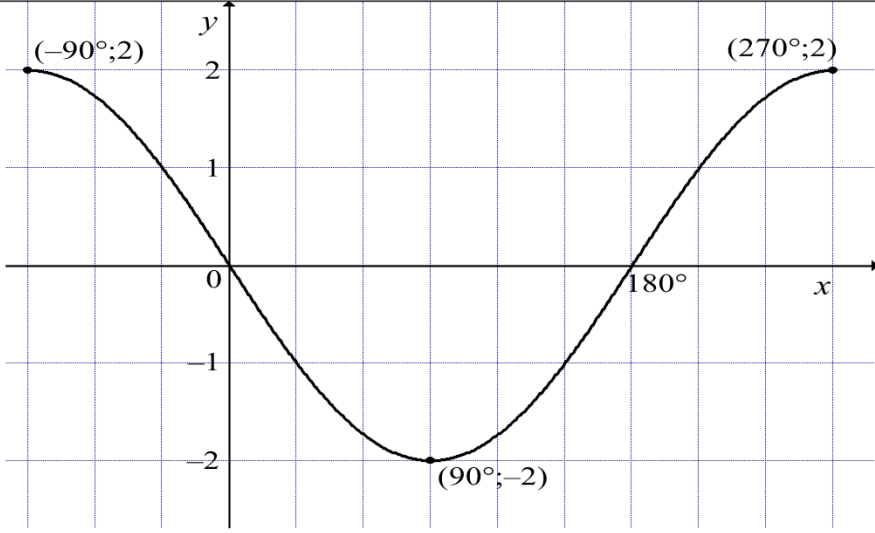
QUESTION 2

| | | |
|------------|---|---|
| 2.1 | 120 cars | ✓ answer (1) |
| 2.2 | $45\,000 < x \leq 55\,000$ OR $45\,000 \leq x < 55\,000$ | ✓✓ answer (2)  ✓✓ answer (2) |
| 2.3 | 46 500 km | ✓✓ answer (accept from 46 000 to 47 000) (2) |
| 2.4 | $120 - 77 = 43 \text{ cars}$ Percentage: $\frac{43}{120} = 35,83\%$ | ✓ 77 (accept 76 to 78) ✓ 43 (accept 42 to 44) ✓ 35,83% (accept 35,0% to 36,67%) (3) |
| [8] | | |

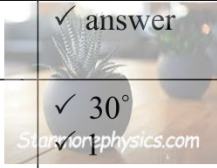
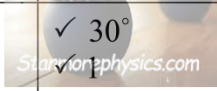
QUESTION 3

| | | |
|-------|---|--|
| 3.1.1 | $\frac{1385}{12}$ $= 115,42$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Answer only: full marks</div> | ✓ $\frac{1385}{12}$ ✓ answer (2) |
| 3.1.2 | 18,67 km | ✓ answer (1) |
| 3.2 | Interval: $(115,42 - 18,67 ; 115,42 + 18,67)$ $= (96,75 ; 134,09)$ Outside of this interval: (82; 89; 94; 135; 140) Therefore: on 5 days | ✓ 96,75 ✓ 134,09 ✓ answer (3) |
| 3.3.1 |  | ✓ whiskers ending at 82 and 140 ✓ box from 97 to 130 ✓ Q_2 at 122 (3) |
| 3.3.2 | The data is skewed to the left OR negatively skewed | ✓ answer (1) |
| 3.4.1 | New mean $= \frac{1385 + 12x}{12}$ $= 115,42 + x$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Answer only: full marks</div> | ✓ $\frac{1385 + 12x}{12}$ ✓ $115,42 + x$ (2) |
| 3.4.2 | 18,67 km | ✓✓ answer (1) |
| | | [13] |

QUESTION 4

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|-----|--|---|
| 4.1 |  | ✓ x-intercepts and y-intercept ✓ turning point ✓ end points ✓ shape (4) |
|-----|--|---|


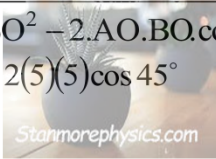
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| 4.2.1 | $b = \frac{1}{2}$ | ✓ answer  | (1) |
| 4.2.2 | A(30°;1) | ✓ 30° ✓ 1  | (2) |
| 4.2.3 | Q(90°; $\frac{1}{2}$) | ✓ 90° ✓ $\frac{1}{2}$ | (2) |
| 4.2.4 | $x = 160^\circ$ | ✓ answer | (1) |
| 4.2.5 | $2 \leq y \leq 4$ OR $y \in [2 ; 4]$ | ✓ endpoints ✓ correct notation ✓ endpoints ✓ correct notation | (2) (2) |
| 4.2.6 | $x = 0^\circ$ or $120^\circ \leq x < 180^\circ$ OR $x = 0^\circ$ or $x \in [120^\circ ; 180^\circ)$ | ✓ $x = 0^\circ$ ✓ endpoints of interval ✓ correct notation ✓ $x = 0^\circ$ ✓ endpoints of interval ✓ correct notation | (3) (3) |
| [15] | | | |

QUESTION 5

| | | | |
|-------|---|--|-----|
| 5.1.1 | 49° | ✓ answer | (1) |
| 5.1.2 | $\frac{DG}{\sin \hat{F}} = \frac{GF}{\sin \hat{D}}$ $\frac{DG}{\sin 35^\circ} = \frac{7}{\sin 14^\circ}$ $DG = \frac{7 \times \sin 35^\circ}{\sin 14^\circ}$ $= \frac{7 \times \sin 35^\circ}{\sin 14^\circ}$ $= 16,60 \text{ m}$ $\frac{DE}{DG} = \sin \hat{E}$ $\frac{DE}{16,60} = \sin 49^\circ$ $DE = 16,60 \times \sin 49^\circ$ $= 12,53 \text{ m}$ | ✓ applying sine rule in triangle DGF ✓ substitution ✓ length of DG ✓ substitution in correct trig ratio ✓ answer | (5) |

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| 5.2.1 | $\hat{AOB} = \frac{360^\circ}{8} = 45^\circ \quad [\angle \text{ s around a point}]$ $AO = BO = r$ $\text{Area of } \triangle AOB = \frac{1}{2} \cdot AO \cdot BO \cdot \sin \hat{AOB}$ $= \frac{1}{2} \cdot r \cdot r \cdot \sin 45^\circ$ $= \frac{1}{2} r^2 \left(\frac{1}{\sqrt{2}} \right) \quad \text{OR} \quad \frac{1}{2} r^2 \left(\frac{\sqrt{2}}{2} \right)$  $\text{Area of the octagon} = 8 \times \text{Area of } \triangle AOB$ $= 8 \times \left(\frac{1}{2\sqrt{2}} \right) r^2 \quad \text{OR} \quad 8 \times \left(\frac{\sqrt{2}}{4} \right) r^2$ $= \left(\frac{4}{\sqrt{2}} \right) r^2 \quad \text{OR} \quad (2\sqrt{2}) r^2 \text{ cm}^2$ $= \left(\frac{2 \times \sqrt{2} \times \sqrt{2}}{\sqrt{2}} \right) r^2$ $= 2\sqrt{2} r^2 \text{ cm}^2$ | <p>✓ $\hat{AOB} = 45^\circ$</p> <p>✓ substitution into area rule</p> <p>✓ $\frac{1}{2} r^2 \left(\frac{1}{\sqrt{2}} \right) \quad \text{OR} \quad \frac{1}{2} r^2 \left(\frac{\sqrt{2}}{2} \right)$</p> <p>✓ $8 \times \text{Area of } \triangle AOB$</p> <p>(4)</p> |
| 5.2.2 | $AB^2 = AO^2 + BO^2 - 2 \cdot AO \cdot BO \cdot \cos \hat{AOB}$ $= 5^2 + 5^2 - 2(5)(5) \cos 45^\circ$ $= 14,64$ $\therefore AB = 3,83 \text{ cm}$ $\therefore \text{perimeter} = 8 \times 3,83 = 30,61 \text{ cm}$  | <p>✓ substitution into cosine rule</p> <p>✓ length of AB</p> <p>✓ answer</p> <p>(3)</p> |
| | | [13] |

QUESTION 6

| | |
|---|--|
| $\begin{aligned} \text{TSA of prism} &= 2(12 \times 20) + 2(12 \times 15) + 2(15 \times 20) \\ &= 480 + 360 + 600 \\ &= 1440 \text{ cm}^2 \end{aligned}$ $\begin{aligned} \text{Area of circular base of cone} &= \pi \times r^2 \\ &= \pi \times 4,5^2 \\ &= 63,62 \text{ cm}^2 \end{aligned}$ $\begin{aligned} \text{Slant height of cone } (\ell) &= \sqrt{h^2 + r^2} \\ &= \sqrt{6^2 + 4,5^2} \\ &= 7,5 \text{ cm} \end{aligned}$ $\begin{aligned} \text{Lateral surface area of cone} &= \pi \times r \times \ell \\ &= \pi \times 4,5 \times 7,5 \\ &= 106,03 \text{ cm}^2 \end{aligned}$ $\begin{aligned} \text{TSA of solid} &= 1440 + 106,03 - 63,62 \\ &= 1482,41 \text{ cm}^2 \end{aligned}$ | $\checkmark 2(12 \times 20) + 2(12 \times 15) + 2(15 \times 20)$ $\checkmark \text{ answer}$ $\checkmark 63,62 \text{ cm}^2$ $\checkmark \text{ using Theorem of Pythagoras}$ $\checkmark 7,5 \text{ cm}$ $\checkmark 106,03 \text{ cm}^2$ $\checkmark \text{ answer}$ |
|---|--|

[7]

TOTAL: 75