KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA




# NATIONAL SENIOR CERTIFICATE

## GRADE 11

## MATHEMATICS

## COMMON TEST

## SEPTEMBER 2022

## MARKING GUIDELINE



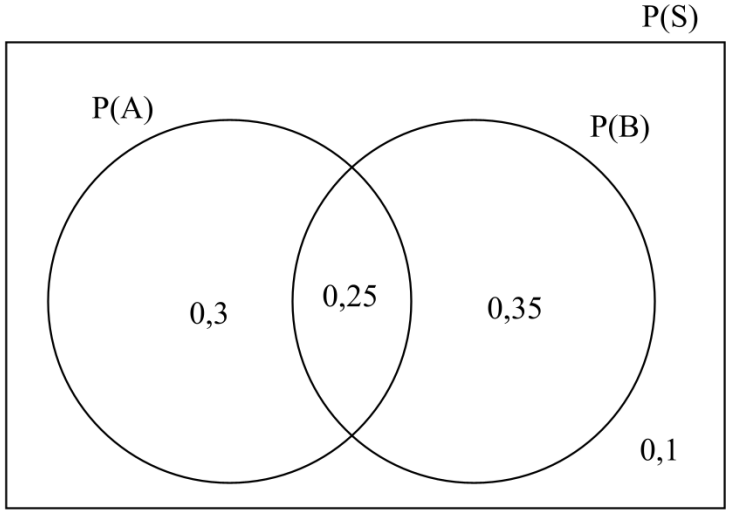

**MARKS:** 75

**This marking guideline consists of 7 pages.**

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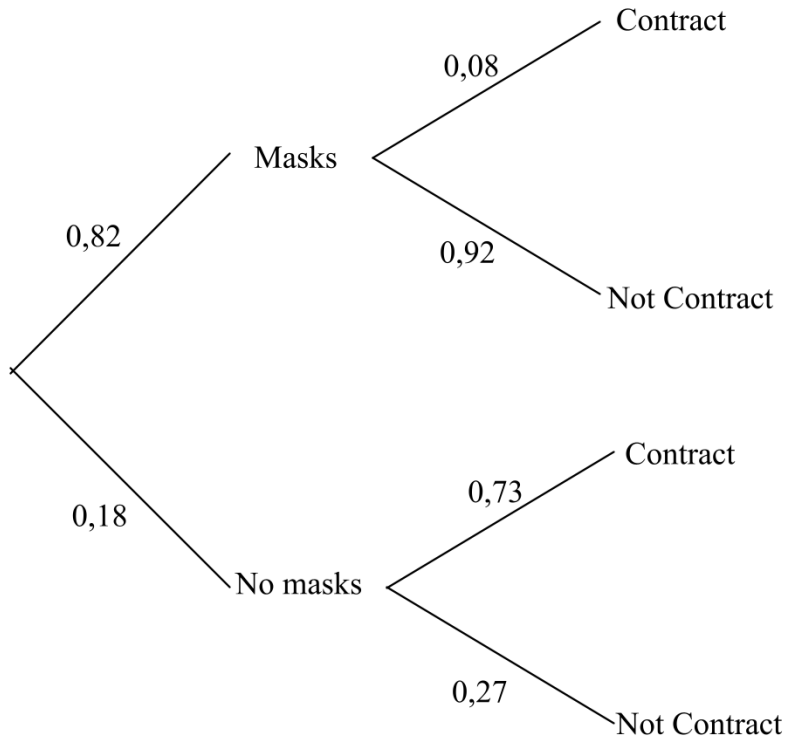
GRADE 11
Marking Guideline

## QUESTION 1

| | | |
|---|---|---|
| 1.1.1 (a) | P(older than 30 years) $= \frac{352}{560}$ $= 0,63$ <br> Answer only: full marks | ✓ 352 (as numerator) <br> ✓ 560 (as denominator) <br> (2) |
| 1.1.1 (b) | P(more than 2 accidents) $= \frac{99}{560}$ $= 0,18$ | ✓ answer $(\frac{99}{560}$ or $0,18)$ <br> (1) |
| 1.1.1 (c) | P(older than 30 years and more than 2 accidents) $= \frac{48}{560}$ $= 0,09$ | ✓ 48 in numerator <br> ✓ answer <br> (2) |
| 1.1.2 | P(older than 30 years) × P(more than 2 accidents) <br> $= \frac{352}{560} \times \frac{99}{560}$ <br> $= \frac{1089}{9800}$ or $0,11$ <br> ∴ P(older than 30 years) × P(more than 2 accidents) ≠ P(older than 30 years and more than 2 accidents) <br> Therefore: the events are not independent | ✓ calculating P(older than 30 years) × P(more than 2 accidents) <br> ✓ reasoning <br> ✓ conclusion <br> (3) |
| 1.2.1 |   | One mark each for the following values placed correctly: <br> ✓ 0,3 <br> ✓ 0,25 <br> ✓ 0,35 <br> ✓0,1 <br> (4) |
| 1.2.2 | P[not(A or B)] = 0,1 | ✓0,1 <br> (1) |
| 1.2.3 | P[A and (not B)] = 0,3 | ✓0,3 <br> (1) |

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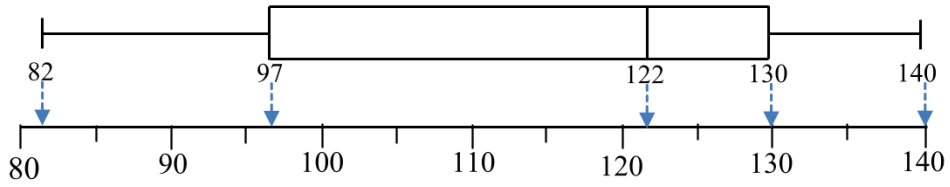
| | | |
|---|---|---|
| 1.3 | A tree diagram may be drawn to represent all the possible outcomes with their probabilities:<br><br><br>P(mask and contract) + P(no mask and contract)<br>$= 0{,}82 \times 0{,}08 + 0{,}18 \times 0{,}73$<br>$= 0{,}20$ or 20% | ✓✓ $0{,}82 \times 0{,}08$<br>✓✓ $0{,}18 \times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

**QUESTION 2**

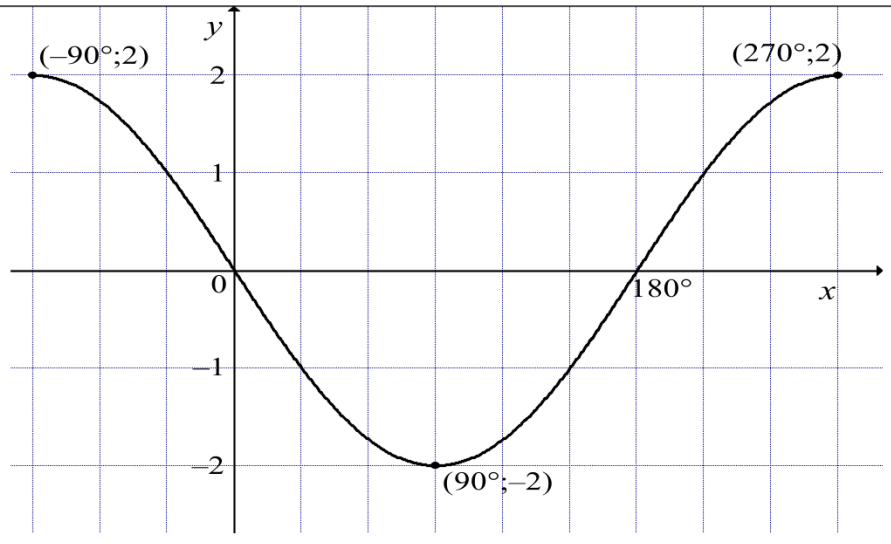
| | | |
|---|---|---|
| 2.1 | 120 cars | ✓ answer<br>(1) |
| 2.2 | $45\,000 < x \leq 55\,000$<br><br>**OR**<br><br>$45\,000 \leq x < 55\,000$ | ✓✓ answer (2)<br><br>✓✓ answer<br>(2) |
| 2.3 | 46 500 km | ✓✓ answer<br>(accept from 46 000 to 47 000)<br>(2) |
| 2.4 | $120 - 77 = 43$ cars<br>Percentage: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

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## QUESTION 3

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

## QUESTION 4

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

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

**QUESTION 5**

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

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

**QUESTION 6**

| | | |
|---|---|---|
| | TSA of prism $= 2(12\times20)+2(12\times15)+2(15\times20)$<br>$= 480+360+600$<br>$= 1440\,\text{cm}^2$ | ✓ $2(12\times20)+2(12\times15)+2(15\times20)$<br>✓ answer |
| | Area of circular base of cone $= \pi\times r^2$<br>$= \pi\times 4,5^2$<br>$= 63,62\ \text{cm}^2$ | ✓ $63,62\ \text{cm}^2$ |
| | Slant height of cone ($\ell$) $= \sqrt{h^2+r^2}$<br>$= \sqrt{6^2+4,5^2}$<br>$= 7,5\,\text{cm}$ | ✓ using Theorem of Pythagoras<br>✓ 7,5 cm |
| | Lateral surface area of cone $= \pi\times r\times \ell$<br>$= \pi\times 4,5\times 7,5$<br>$= 106,03\ \text{cm}^2$ | ✓ $106,03\ \text{cm}^2$ |
| | TSA of solid $= 1440+106,03-63,62$<br>$= 1482,41\ \text{cm}^2$ | ✓ answer<br>**[7]** |

**TOTAL: 75**

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