Downloaded From Stanmorephysics.com

KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

FINAL

NATIONAL SENIOR CERTIFICATE

GRADE 11

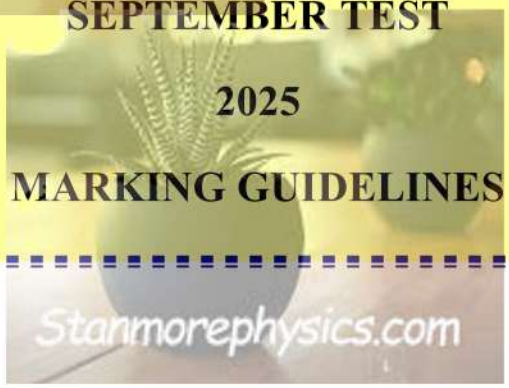


MATHEMATICS

SEPTEMBER TEST

2025

MARKING GUIDELINES



MARKS: 75

These marking guidelines consist of 7 pages.

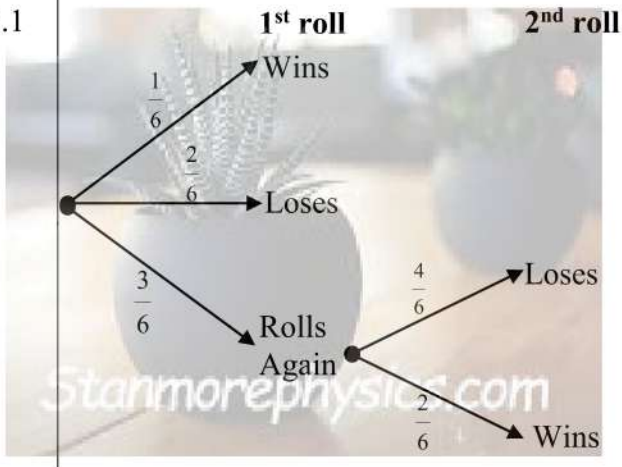
Copyright Reserved

QUESTION 1

1.1.1	$A = P(1-i)^n$ $A = 20\,000(1-0,13)^7$ $A = R7\,545,10$ B/D incorrect formula Only penalize here for incorrect rounding off.	✓A correct subst. into correct formula ✓CA answer (2)
1.1.2	Value in dollars $= \frac{R7\,545,10}{R18,45/\$1}$ $= \$408,95$ Answer only: **Full marks**	✓CA $\frac{\text{Book value}}{18,45}$ ✓CA answer (2)
1.2	$1+i_{eff} = \left(1+\frac{i_{nom}}{m}\right)^m$ $1+i_{eff} = \left(1+\frac{0,09}{4}\right)^4$ $i_{eff} = \left(1+\frac{0,09}{4}\right)^4 - 1$ $r = 9,31\%$ per annum	✓A correct formula ✓A correct substitution into formula ✓CA answer (3)
1.3	$A = P(1+in)$ $500050 = P(1+0,12\,x\,5)$ $P = \frac{500050}{(1+0,12\,x\,5)}$ $P = R312531,25$ B/D incorrect formula	✓A correct subst. into correct formula ✓CA answer (2)
1.4	$A = P(1+i)^n$ $18 = 16,25(1+i)^3$ $i = \sqrt[3]{\frac{18}{16,25}} - 1$ $r = 3,47\%$ B/D incorrect formula and if A and P are swopped	✓A P = 16,25; A = 18; n = 3 ✓A subst. into correct formula ✓CA simplifying using $\sqrt[3]{.....}$ ✓CA answer (4)
1.5	$A = P(1+i)^n$ $36\,193,15 = 12\,000\left(1+\frac{0,1135}{m}\right)^{20}$ $1+\frac{0,1135}{m} = \sqrt[20]{\frac{36\,193,15}{12\,000}}$ $m = \frac{0,1135}{\sqrt[20]{\frac{36\,193,15}{12\,000}} - 1}$ $m = 2$ m must be a whole number $\therefore$ it takes **10** years (account compounds half – yearly)	✓A correct subst. of A and P ✓A correct subst. of i and exponent 20 ✓CA simplification ✓CA value of compounding period ✓CA answer (5)
		[18]

Stanmorephysics.com

QUESTION 2

2.1.1	$P(B) = 1 - P(\text{not } B)$ $= 1 - 0,67$ $= 0,33$ Answer only: $\frac{2}{2}$	✓A subst. into correct rule ✓A answer (2)
2.1.2	$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $0,57 = P(A) + 0,33 - 0$ $P(A) = 0,24$ B/D if $P(A \text{ and } B) \neq 0$ **OR** $P(A \text{ or } B) = P(A) + P(B)$ $0,57 = P(A) + 0,33$ $P(A) = 0,24$	✓A correct rule ✓CA substitution ✓CA answer (3) **OR** ✓A correct rule ✓CA substitution ✓CA answer (3)
2.2.1	$m = 4$ $p = 35$	✓A 4 ✓A 35 (2)
2.2.2	$P = \frac{22}{140}$ $P = \frac{11}{70}$ Accept $\frac{22}{140}$ or 0,16 or 15,71% as answers	✓A $\frac{11}{70}$ (1)
2.2.3	$P(\text{moderate and R40 000} < x \leq \text{R65 000}) = \frac{12}{140}$ $= \frac{3}{35}$ **OR** 0,09 $P(\text{moderate}) \times P(\text{R40 000} < x \leq \text{R65 000}) = \frac{30}{140} \times \frac{25}{140}$ $= \frac{15}{392}$ **OR** 0,04 $P(\text{moderate and} > \text{R40 000}) \neq P(\text{moderate}) \times P(> \text{R40 000})$ $\therefore$ the events are NOT INDEPENDENT	✓A $\frac{3}{35}$ **OR** 0,09 ✓A $\frac{30}{140} \times \frac{25}{140}$ ✓A $\frac{15}{392}$ **OR** 0,04 ✓CA conclusion (4)
2.3.1	 **OUTCOMES** Wins Loses Rolls Again & Loses Rolls Again & Wins	✓A both branches correct ✓A correct probabilities: $\frac{1}{6}$; $\frac{2}{6}$ **OR** $\frac{1}{3}$; $\frac{3}{6}$ **OR** $\frac{1}{2}$ on 1st roll ✓A correct probabilities: $\frac{4}{6}$ **OR** $\frac{2}{3}$; $\frac{2}{6}$ **OR** $\frac{1}{3}$ on 2nd roll ✓A outcomes (4)
2.3.2	$P(\text{win on the first roll}) = \frac{1}{6}$ **OR** 0,17 **OR** 16,67%	✓A $\frac{1}{6}$ (1)
2.3.3	$P(\text{loses}) = P(L) + P(\text{Rolls Again and Loses})$ $P(\text{loses}) = \frac{2}{6} + \frac{3}{6} \times \frac{4}{6}$	✓CA $\frac{2}{6}$ **OR** $\frac{1}{3}$

Copyright Reserved

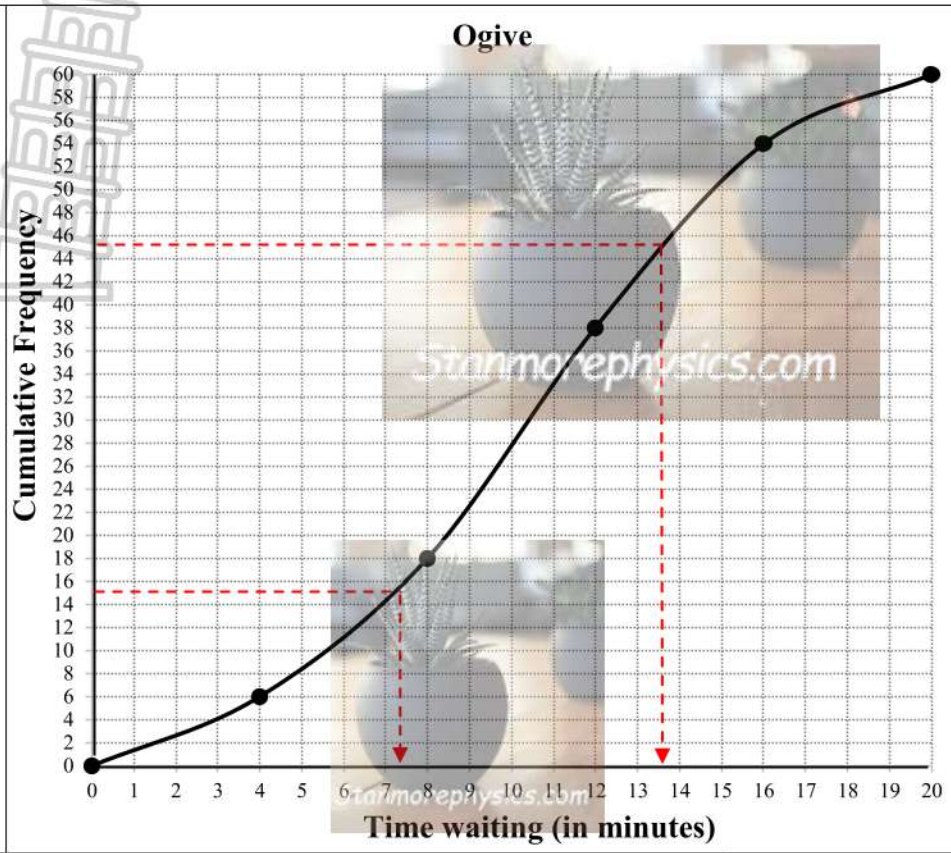
	$P(\text{loses}) = \frac{1}{3} + \frac{1}{3}$ $P(\text{loses}) = 66{,}67\%$	✓CA $\frac{3}{6}\times\frac{4}{6}$ **OR** $\frac{1}{2}\times\frac{2}{3}$ ✓CA answer (3)
		[20]

QUESTION 3

3.1.1	$\bar{x} = \frac{242}{9}$ $= 26{,}89$ Answer only: $\frac{2}{2}$	✓A 242 ✓CA answer **Note: CA only if divided by 9** (2)
3.1.2	$\sigma = 19{,}56$	✓A 19,56 (1)
3.1.3	$\bar{x} - \sigma = 26{,}89 - 19{,}56$ = 7,33 (no. of learners < ONE std deviation below the mean) ∴ 1 year	✓CA $\bar{x} - \sigma$ ✓CA answer (2)
3.2.1	$8 < x \leq 12$	✓A answer (1)
3.2.2		✓A 6; 18 ✓CA 38; 54; 60 (2)
3.2.3	60 learners	✓CA answer (1)

Time waiting (in minutes)	Number of learners	Cumulative frequency
$0 < x \leq 4$	6	**6**
$4 < x \leq 8$	12	**18**
$8 < x \leq 12$	20	**38**
$12 < x \leq 16$	16	**54**
$16 < x \leq 20$	6	**60**

Stanmorephysics.com

3.2.4		✓CA points plotted at upper limit ✓A shape: smooth curve ✓A grounding at (0 ; 0) (3)
3.2.5	$Q_1 \approx 7,5$ $Q_3 \approx 13,5$ $IQR = 13,5 - 7,5$ $= 6$	✓CA $Q_1 = 7,5$ (accept 7 to 8) ✓CA $Q_3 = 13,5$ (accept 13 to 14) ✓CA answer (accept 6 to 7) (3)
		[15]

QUESTION 4

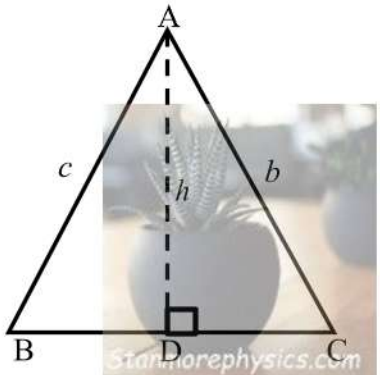
4.1	Amplitude of $f = 1$	✓A 1 (1)
4.2	Period of $g = 360°$	✓A 360° (1)
4.3	$b = 2$ $q = 1$ $p = 30°$	✓A $b = 2$ ✓A $q = 1$ ✓A $p = 30°$ (3)
4.4.1	$x \in [0° ; 60°]$ **OR** $0° \leq x \leq 60°$ If $x \in (0° ; 60°)$ **OR** $0° < x < 60°$: **1 mark**	✓A critical values/endpoints ✓A notation (2)
4.4.2	$f(x) - \sin 30° = g(x) + 1$ $f(x) - \frac{1}{2} = g(x) + 1$ $f(x) = g(x) + 1,5$ $\therefore x = 90°$ Also accept: $x = 34,4°$ or $x = 166,4°$	✓A $\sin 30° = \frac{1}{2}$ **OR** 0,5 ✓A manipulation ✓A answer (3)

Copyright Reserved

4.5	$h(x)=\sin(-x)$ $=-\sin x$ $=\cos(90°+x)$ $=\cos(x+30°+60°)$ $\therefore k=60°$ Answer only: $\frac{2}{2}$	✓A $\cos(90°+x)$ ✓A $k=60°$ (2)
		[12]

QUESTION 5

5.1



Construction: Draw perpendicular height AD.

In ΔABD: $\sin B=\frac{h}{c}$

$\therefore h=c\sin B$

In ΔADC: $\sin C=\frac{h}{b}$

$\therefore h=b\sin C$

$\therefore c\sin B=b\sin C$

$\frac{c\sin B}{bc}=\frac{b\sin C}{bc}$

$\frac{\sin B}{b}=\frac{\sin C}{c}$

OR

✓A construction

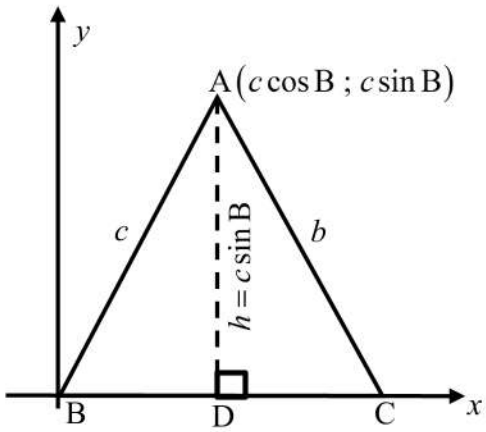
✓A $\sin B=\frac{h}{c}$

✓A $h=c\sin B$

✓A $h=b\sin C$

✓A $\frac{c\sin B}{bc}=\frac{b\sin C}{bc}$

(5)



Construction: Draw perpendicular height AD.

In ΔABC: $h = c\sin B$

In ΔADC: $\sin C = \frac{h}{b}$

$\therefore h = b\sin C$

$\therefore c\sin B = b\sin C$

$\frac{c\sin B}{bc} = \frac{b\sin C}{bc}$

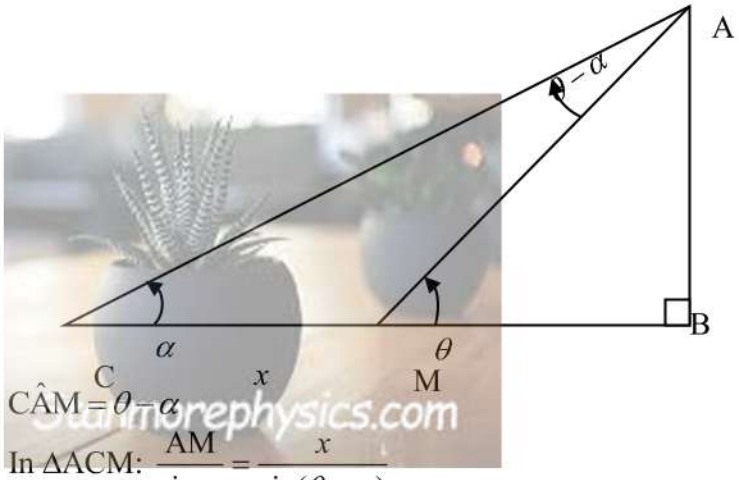
$\frac{\sin B}{b} = \frac{\sin C}{c}$

✓A construction
✓A y_A or $h = c\sin B$
✓A $\sin C = \frac{h}{b}$
✓A $h = b\sin C$

✓A equating and ÷ by bc

(5)

5.2



$C\hat{A}M = \theta - \alpha$

In ΔACM: $\frac{AM}{\sin\alpha} = \frac{x}{\sin(\theta-\alpha)}$

$\therefore AM = \frac{x\sin\alpha}{\sin(\theta-\alpha)}$

In ΔAMB: $\sin\theta = \frac{AB}{AM}$

$\therefore AB = AM \times \sin\theta$

$= \frac{x\sin\alpha.\sin\theta}{\sin(\theta-\alpha)}$

✓A $C\hat{A}M = \theta - \alpha$

✓A correct subst. into sine rule

✓A $AM = \frac{x\sin\alpha}{\sin(\theta-\alpha)}$

✓A correct trig ratio

✓A $AB = AM\sin\theta$

(5)

[10]

TOTAL MARK: 75

Copyright Reserved