KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10

Stanmorephysics.com

MATHEMATICS

COMMON TEST

MARCH 2025

Stanmorephysics.com

MARKING GUIDELINE

MARKS: 75

This marking guideline consists of 9 pages.

Copyright Reserved

NSC
Marking Guideline

QUESTION 1

1.1.1	9	✓A	(1)
1.1.2	7	✓A	(1)
1.1.3	0	✓A	(1)
1.2	$\sqrt{169} < \sqrt{170} < \sqrt{196}$ $13 < \sqrt{170} < 14$	✓A square root of perfect sq. ✓A answers	(2)
1.3.1	$(x-2y)(x^2+2xy+4y^2)$ $= x^3+2x^2y+4xy^2-2x^2y-4xy^2x^3-8y^3$ $= x^3-8y^3$ **ANSWER ONLY: FULL MARKS**	✓A removing brackets ✓CA answer	(2)
1.3.2	$(5-4x)^2$ $=(5-4x)(5-4x)$ $=25-20x-20x+16x^2$ $=25-40x+16x^2$ **ANSWER ONLY: FULL MARKS**	✓A removing brackets ✓CA answer	(2)
1.3.3	$\frac{3}{x^2-9}+\frac{2}{x-3}-\frac{1}{x+3}$ $=\frac{3}{(x+3)(x-3)}+\frac{2}{x-3}-\frac{1}{x+3}$ $=\frac{3+2(x+3)-1(x-3)}{(x+3)(x-3)}$ $=\frac{3+2x+6-x+3}{(x+3)(x-3)}$ $=\frac{x+12}{(x+3)(x-3)}$	✓A $(x+3)(x-3)$ ✓A numerator ✓CA simplification ✓CA answer	(4)

Stanmorephysics.com

NSC
Marking Guideline

1.3.4	$\frac{10^{2x+3}.4^{1-x}}{25^{2+x}}$ $=\frac{(5.2)^{2x+3}.\left(2^2\right)^{1-x}}{\left(5^2\right)^{2+x}}$ $=\frac{5^{2x+3}.2^{2x+3}.2^{2-2x}}{5^{4+2x}}$ $=5^{2x+3-4-2x}.2^{2x+3+2-2x}$ $=5^{-1}.2^5$ $=\frac{32}{5}$	✓A prime bases ✓CA removing brackets ✓CA simplification ✓CA answer	(4)
1.4.1	$2x^2-18$ $=2\left(x^2-9\right)$ $=2(x-3)(x+3)$	✓A common factor ✓CA answer	(2)
1.4.2	$8+125a^3$ $=(2+5a)\left(4-10a+25a^2\right)$	✓A $(2+5a)$ ✓A $-10a$ ✓A $\left(4.....+25a^2\right)$	(3)
1.4.3	$x^3-2x^2+5x-10$ $=x^2(x-2)+5(x-2)$ $=\left(x^2+5\right)(x-2)$	✓A grouping ✓A $\left(x^2+5\right)$ ✓CA $(x-2)$	(3)
1.5.1	2^{-x} $=\frac{1}{2^x}$ $=\frac{1}{3}$	✓A answer	(1)
1.5.2	8^x $=2^{3x}$ $=\left(2^x\right)^3$ $=(3)^3$ $=27$	✓A $\left(2^x\right)^3$ ✓A answer	(2)

Stanmorephysics.com

1.5.3	$\left(\frac{1}{16}\right)^x$ $=\left(\frac{1}{2^4}\right)^x$ $=\left(2^{-4}\right)^x$ $=\left(2^x\right)^{-4}$ $=(3)^{-4}$ $=3^{-4}$ $=\frac{1}{81}$	✓A 2^{-4} ✓CA simplification ✓CA answer	(3)
			[31]

Stanmorephysics.com

QUESTION 2

2.1.1	$3x(x-8)=0$ $x=0 \quad or \quad x=8$	✓A ✓A	(2)
2.1.2	$7x^2-5x-2=0$ $(7x+2)(x-1)=0$ $x=\frac{-2}{7} \quad or \quad x=1$	✓A factors ✓CA ✓CA	(3)
2.1.3	$3^{5x-4}-729=0$ $3^{5x-4}=729$ $3^{5x-4}=3^6$ $5x-4=6$ $5x=10$ $x=2$	✓A prime base ✓CA simplification ✓CA answer	(3)

2.1.4	$2x^{\frac{-3}{2}} = 128$ $x^{\frac{-3}{2}} = 64$ $x^{\frac{-3}{2}\times\left(\frac{-2}{3}\right)} = 2^{6\times\left(\frac{-2}{3}\right)}$ $x = 2^{-4}$ $x = \frac{1}{16}$ **OR** $2x^{\frac{-3}{2}} = 128$ $x^{\frac{-3}{2}} = 64$ $x^{\frac{-3}{2}\times\left(\frac{-2}{3}\right)} = 64^{\left(\frac{-2}{3}\right)}$ $x = \frac{1}{16}$	✓A division by 2 ✓A × reciprocal of exp. ✓CA 2^{-4} ✓CA answer ✓A division by 2 ✓A × reciprocal of exp. ✓CA✓CA answer	(4)
2.1.5	$2^{x+1} + 2^{x-1} = 20$ $2^x.2 + 2^x.2^{-1} = 20$ $2^x\left(2 + 2^{-1}\right) = 20$ $2^x\left(\frac{5}{2}\right) = 20$ $2^x = 8$ $2^x = 2^3$ $x = 3$	✓A common factor ✓CA simplification ✓CA division by $\frac{5}{2}$ ✓CA prime bases ✓CA answer	(5)
2.2	$\left(a^3 + 2a^{-3}\right)^2 = \left(a^3 - 2a^{-3}\right)^2 + b$ $\left(a^3 + 2a^{-3}\right)^2 - \left(a^3 - 2a^{-3}\right)^2 = b$ $\left[\left(a^3 + 2a^{-3}\right) + \left(a^3 - 2a^{-3}\right)\right]\left[\left(a^3 + 2a^{-3}\right) - \left(a^3 - 2a^{-3}\right)\right] = b$ $\left(a^3 + 2a^{-3} + a^3 - 2a^{-3}\right)\left(a^3 + 2a^{-3} - a^3 + 2a^{-3}\right) = b$ $\left(2a^3\right)\left(4a^{-3}\right) = b$ $8 = b$	✓A factorising ✓CA simplification ✓CA simplification ✓CA answer	

Stanmorephysics.com

	OR $\left(a^3+2a^{-3}\right)^2-\left(a^3-2a^{-3}\right)^2=b$ $a^6+4+4a^{-6}-\left(a^6-4+4a^{-6}\right)=b$ $a^6+4+4a^{-6}-a^6+4-4a^{-6}=b$ $8=b$	✓A a^6+4+4a^{-6} ✓A a^6-4+4a^{-6} ✓CA simplification ✓CA answer	(4)
2.3.1	$-9\le -2x+3<5$ $-9-3\le -2x<5-3$ $-12\le -2x<2$ $\therefore -1<x\le 6$	✓A simplification ✓CA answer	(2)
2.3.2		✓CA critical values ✓CA ○ ●	(2)
2.4	$2x-y=17$.....equation 1 $4y+3x=9$.....equation 2 $y=2x-17$.....equation 3 substitute equation 3 into equation 2 $4(2x-17)+3x=9$ $8x-68+3x=9$ $11x=77$ $\therefore x=7$ substitute x – value into equation 3 $y=2(7)-17$ $y=-3$ **OR**	✓A equation 3 ✓CA substitution ✓CA value of x ✓CA value of y	

Stanmorephysics.com

	$2x-y=17$.....equation 1 $4y+3x=9$.....equation 2 $x=\frac{y+17}{2}$.....equation 3 substitute equation 3 into equation 2	✓A equation 3	
	$4y+3\left(\frac{y+17}{2}\right)=9$	✓CA substitution	
	$4y+\frac{3y+51}{2}=9$ $8y+3y+51=18$ $11y=-33$ $y=-3$ substitute $y-$value into equation 3	✓CA value of y	
	$x=\frac{(-3)+17}{2}$ $x=7$	✓CA value of x	
	OR		
	$2x-y=17$.....equation 1 $4y+3x=9$.....equation 2 multiply equation (1) by 4 $8x-4y=68$ $\therefore 4y=8x-68$ but $4y=9-3x$ ..... from equation 1 $\therefore 8x-68=9-3x$ $11x=77$ $x=7$ substitute $x-$value into equation 1 $2(7)-y=17$ $y=3$	✓A $4y=8x-68$ ✓CA equating ✓CA value of x ✓CA value of y	(4)
			[29]

NSC
Marking Guideline

QUESTION 3

3.1.1a	$PR^2 = QR^2 + QP^2$ Pythag $13^2 = QR^2 + 5^2$ $\sqrt{QR^2} = \sqrt{13^2 - 5^2}$ $QR = 12$ **ANSWER ONLY: FULL MARKS**	✓A correct substitution ✓CA answer	(2)
3.1.1b	$\cos\theta = \frac{5}{13}$	✓A	(1)
3.1.1c	$\cot\theta = \frac{5}{12}$	✓CA	(1)
3.1.1d	$\sec Q\hat{R}P = \frac{13}{12}$	✓CA	(1)
3.1.2	$\sin\theta = \frac{QR}{PR}$ **OR** $\cos Q\hat{R}P = \frac{QR}{PR}$	✓A	(1)
3.2.1	$\cos(53° - 34°)$ $= 0,95$ **PENALISE HERE FOR ROUNDING**	✓A correct substitution ✓CA	(2)
3.2.2	$\sin^2 B$ $= (\sin 53°)^2$ $= 0,64$	✓A correct substitution ✓CA	(2)
3.3	$= \frac{\frac{2}{\sqrt{2}} \times \frac{\sqrt{3}}{2}}{\frac{\sqrt{2}}{2} \times \frac{\sqrt{3}}{2}}$ $= \frac{2}{\sqrt{2}} \times \frac{2}{\sqrt{2}}$ $= 2$	✓A $\text{cosec}45° = \frac{2}{\sqrt{2}}$ ✓A $\sin 45° = \frac{\sqrt{2}}{2}$ ✓A $\cos 30° = \frac{\sqrt{3}}{2}$ ✓CA simplification ✓CA answer	

Stanmorephysics.com

	OR $= \frac{\sqrt{2} \times \frac{\sqrt{3}}{2}}{\frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2}}$ $= \sqrt{2} \times \frac{\sqrt{2}}{1}$ $= 2$	✓A $\text{cosec}45° = \sqrt{2}$ ✓A $\sin 45° = \frac{1}{\sqrt{2}}$ ✓A $\cos 30° = \frac{\sqrt{3}}{2}$ ✓CA simplification ✓CA answer	(5)
			[15]
		TOTAL:	**75**

Stanmorephysics.com