

higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T930(E)(M31)T
APRIL EXAMINATION
NATIONAL CERTIFICATE
MATHEMATICS N1

(16030121)

31 March 2015 (Y-Paper)
13:00–16:00

Scientific calculators may be used.

This question paper consists of 6 pages, a graph paper and a formula sheet of 2 pages.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
MATHEMATICS N1
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. Use a pencil for drawings.
 6. The answers of ALL calculations must be approximated to THREE decimals.
 7. Rough calculations may be done at the back of the ANSWER BOOK.
 8. Start each question on a NEW page.
 9. Write neatly and legibly.
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QUESTION 1

1.1 Simplify without the use of calculator:

$$\log 20 - \log_2 32 + \log 5 \quad (5)$$

1.2 Simplify by ONLY making use of exponential laws:

$$6(a^{\circ}b^{\circ})^7 \times \frac{2(a^3)^5}{a^5} \quad (4)$$

1.3 Show ALL calculations and use logarithms to the base e to determine the value of x :

$$x = \frac{3,25^4}{2,86} \quad (6)$$

[15]

QUESTION 2

2.1 Divide $d^3 + 12d^2 + 14d + 5$ by $d + 1$ (6)

2.2 Add the following terms:

$$-108px - 115qr + 130bd \text{ and } 42bd - 78px + 65qr \quad (3)$$

2.3 Remove the brackets and simplify the following:

$$(p-2)(p^2-3p-10) \quad (5)$$

2.4 Fully factorise the following expressions using prime factors:

$$2.4.1 \quad 2p - 8 + pm - 4m \quad (5)$$

$$2.4.2 \quad \frac{1}{2}xy + \frac{1}{2}xy^2 - \frac{1}{2}x^2y \quad (2)$$

2.5 Determine the highest common factor (HCF) and the lowest common multiple (LCM) of the following expressions:

$$81abc$$

$$12a^2bc$$

$$21ab^2c \quad (6)$$

2.6 Simplify the following:

$$\frac{7t^2 - 21t^3}{5p} \div \frac{3t - 9t^2}{10p} \quad (4)$$

[31]

QUESTION 33.1 Solve for x :

$$12 + 3x + 3 = 4(30 - x) \quad (4)$$

3.2 The sum of THREE successive uneven numbers is 21. Determine the THREE numbers.

Let the first number be y . (4)3.3 $V = \frac{1}{2}\pi r^2 h$ is the formula used to calculate the volume of a cone. Manipulate the formula to make r the subject of the formula. (3)3.4 Calculate the value of r if: $v = 7$; $h = 6$ (3)
[14]**QUESTION 4**

4.1 Draw, on the graph paper and on the same system of axis, the function of each of the following graphs:

4.1.1 $y = -x + 1$ and $x = -4$ (6)

4.1.2 Read off the coordinates of the point of the intersection of the two graphs (2)

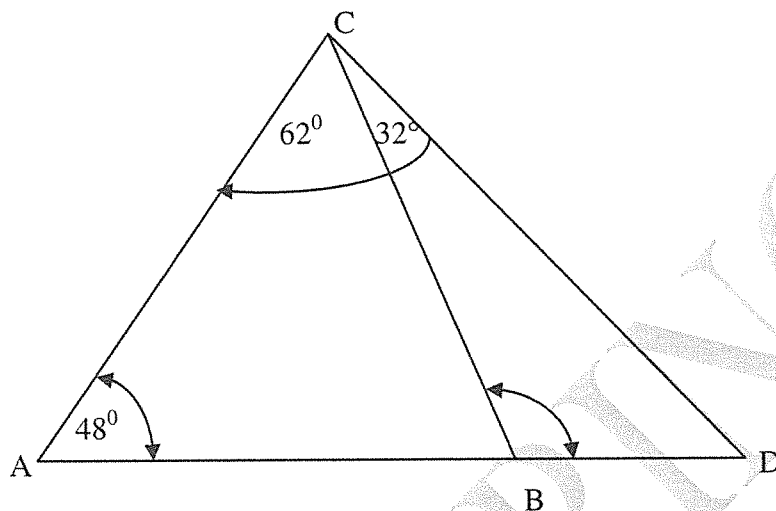
4.2 Given:

x	0	1	a	4	6
y	2	3	5	6	b

4.2.1 Give the values of a and b 4.2.2 Give the equation that shows the relationship of y to x (2 × 2) (4)
[12]

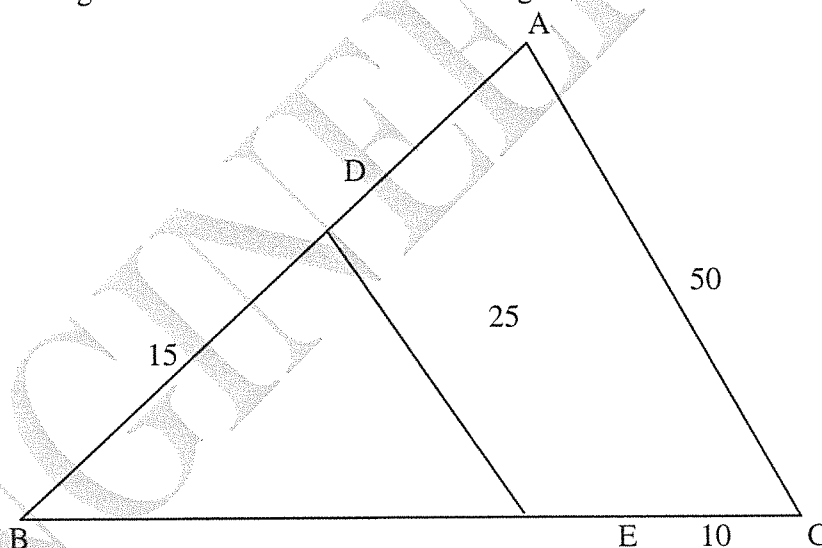
QUESTION 5

- 5.1 Calculate the magnitude of angle $\hat{C}BD$ and the magnitude of angle $\hat{C}BD$ in the given figure with reasons.



(6)

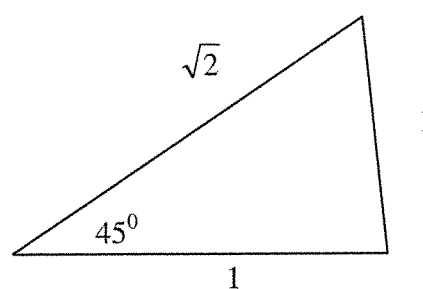
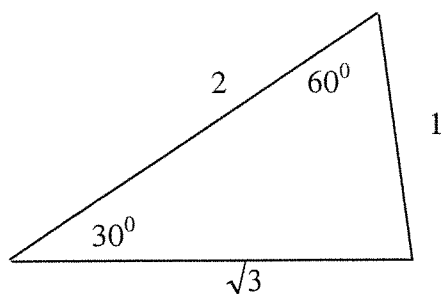
- 5.2 Calculate the length of side AB and AD from the figure below.



(6)

- 5.3 Simplify the following expressions by making use special angles. DO NOT USE A CALCULATOR.

$$\sqrt{4} \cdot \cos 45^\circ (\sin 45^\circ)$$

(4)
[16]

QUESTION 6

- 6.1 How many floor tiles, each measuring 415 mm \times 390 mm are required to cover a floor measuring 4,5 m by 5,5 m? (5)
- 6.2 Calculate the following:
- 6.2.1 12% of R1 003,17 (1)
- 6.2.2 7,5% of 300 mm; give your answer in cm (2)
- 6.3 The price of Sasko bread is R7,50 and it is increased by 8%; calculate the new price. (4)
- [12]

TOTAL: 100

G.P.-S. 008-0148

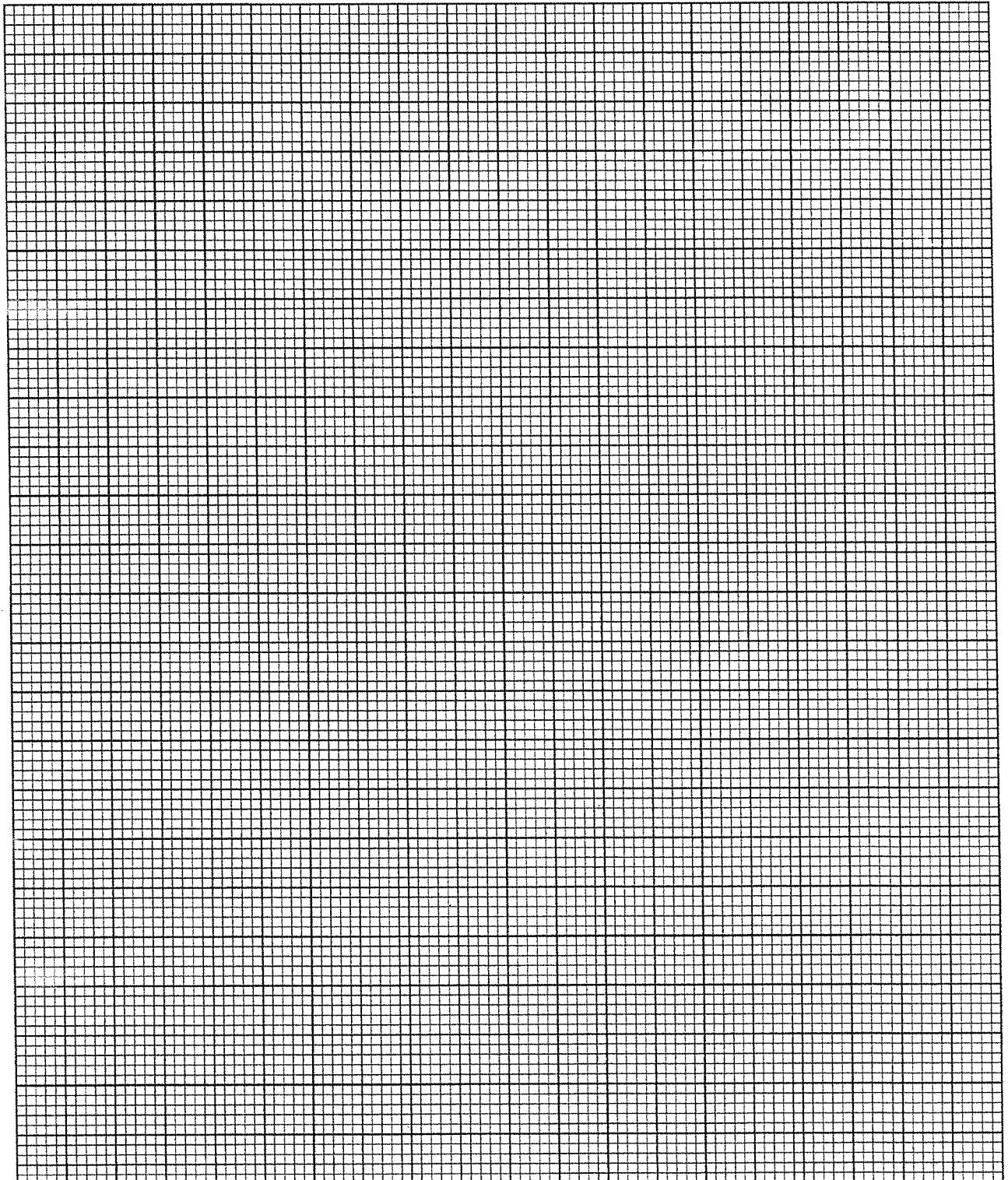


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DEPARTEMENT VAN HOËR ONDERWYS EN OPLEIDING
GRAPH PAPER/GRAFIEKPAPIER

(Return this sheet with the other answers)
(Lewer hierdie blad saam met u antwoordboek in)

EXAMINATION NUMBER:

EKSAMMENOMMER:

[illegible]

MATHEMATICS N1**FORMULA SHEET**

This sheet must accompany the question paper.

Rectangle: Perimeter = $2(l + b)$
 Area = $l \times b$

Square: Perimeter = $4a$
 Area = a^2

Triangle: Perimeter = $a + b + c$
 Area = $\frac{1}{2}b \times h$

Rectangular prism:
 Volume = $l \times b \times h$

Right triangular prism:
 Volume = $\frac{1}{2}b \times h \times l$

Cube: Volume = a^3

Right pyramid:
 Volume = $\frac{1}{3}(\text{base area} \times h)$

Ellipse:
 Area = $\frac{\pi}{4}(\text{major axis} \times \text{minor axis})$

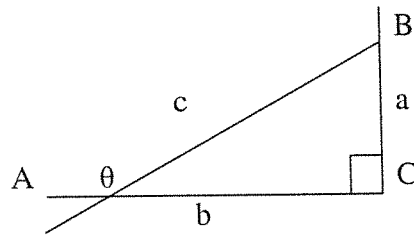
Circle: Circumference = πD or $2\pi r$
 Area = $\frac{\pi D^2}{4}$ or πr^2

Cylinder: Volume = $\frac{\pi D^2}{4} \times h$ or $\pi r^2 h$

Cone: Volume = $\frac{\pi D^2}{4} \times \frac{h}{3}$ or $\frac{\pi r^2 h}{3}$

Annulus: $A = \pi(R^2 - r^2)$

The right-angled triangle:



The theorem of Pythagoras:
 $c^2 = a^2 + b^2$

Ratios of angle θ :

$$\sin\theta = \frac{a}{c} \quad \cos\theta = \frac{b}{c} \quad \tan\theta = \frac{a}{b}$$