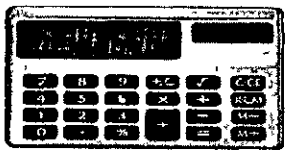
UNIVERSITY EXAMINATIONS



UNIVERSITEITSEKSAMENS

UNISA university of south africa

BNU1501 (496313) October/November 2015

BASIC NUMERACY

Duration 2 Hours 100 Marks

EXAMINERS
FIRST MRS JC BEDEKER
SECOND DR S MUKERU

Programmable pocket calculator is permissible

Closed book examination

This paper consists of 12 pages, including 3 pages for rough work

Answer *all* the questions

Please complete the attendance register on the back page of this paper, tear it off and hand it to the invigilator

Answer all the questions on the mark-reading sheet supplied Carefully follow the instructions for completing the mark-reading sheet Also pay attention to the following

- Only one option (indicated as [1] [2] [3] [4]) per question is correct Do not mark more than one option per question on the mark-reading sheet
- Marks will not be deducted for incorrect answers
- The paper consists of 25 questions for a total of 100 marks

Please write your name on the mark-reading sheet. This will enable us to be able to link you to the mark-reading sheet if you have entered your student number incorrectly.

Question 1

Simplify the following expression

$$2y^2(x-1) - 8x(y^2-1)$$

[1] $-6xy^2 - 2y^2 - 8x$

[2] $-6xy^2 - 2y^2 + 8x$

[3] $2yx^3 - 2y^3 - 8xy^3 + 8x$

[4] $-6xy^3 - 2y^2 + 8x$

Question 2

Simplify the following expression

$$2xy^2 - \left(4x^2y^3\right)^2 \times 8x^4y^5$$

[1] $2xy$

[2] $4x^3y$

[3] $xy^{\frac{5}{1}}$

[4] xy

Question 3

Simplify the following expression

$$\sqrt{36x^2y^4}$$

[1] $6xy^2$

[2] $18xy^2$

[3] $6x^2y^4$

[4] $18x^2y^4$

Question 4

Solve for x in the following equation

$$2x - 1 = 3x$$

[1] $\frac{1}{5}$

[2] 1

[3] -1

[4] $-\frac{1}{5}$

Question 5

Solve for x in the following equation

$$2x + 2 = 2(2 - x) + 6$$

[1] $\frac{8}{3}$

[2] 8

[3] $\frac{4}{3}$

[4] 2

Question 6

If a certain number x is increased by 7 it will be equal to twice that same number decreased by 3 The correct mathematical expression or equation for the sentence given above, is

[1] $7x = -3(2x)$

[2] $x - 7 = 2(x + 3)$

[3] $x + 7 = 2x - 3$

[4] $7x = 2x - 3$

Question 7

A dealer buys 120 pens of which x cost R3 each and the rest R4 each An expression, in terms of x, for the number of the more expensive pens he buys, is

[1] $(120 - x)$ pens

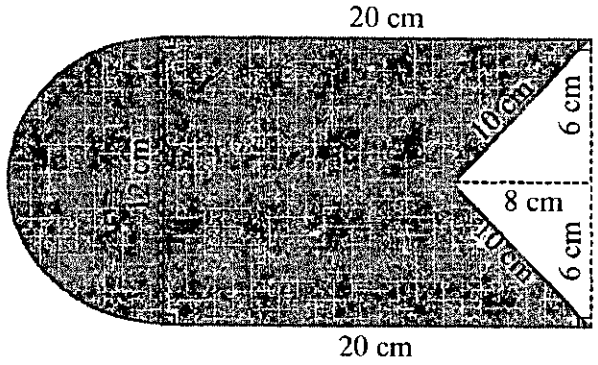
[2] $4x$ pens

[3] $(120 - 3x)$ pens

[4] $(x - 120)$ pens

Question 8

Consider the figure below The dotted lines indicate lengths Determine the perimeter of the shaded part, in centimetres rounded to two decimal digits



[1] 173,10

[2] 78,85

[3] 70,85

[4] 92,00

Question 9

Determine the area of the shaded part shown in the figure in question 8 (rounded to two decimal digits) The area is

[1] 305,10 cm^2

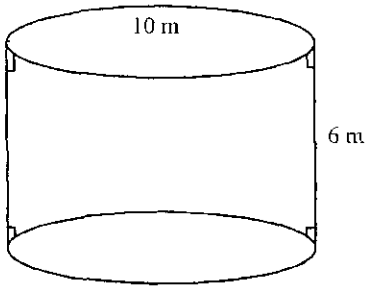
[2] 344,55 cm^2

[3] 210,85 cm^2

[4] 248,55 cm^2

Question 10

Calculate the volume of water needed to fill a reservoir with the dimensions shown in the figure below Give the answer **in litres**, rounded to the nearest litre



[1] 471 239 ℓ

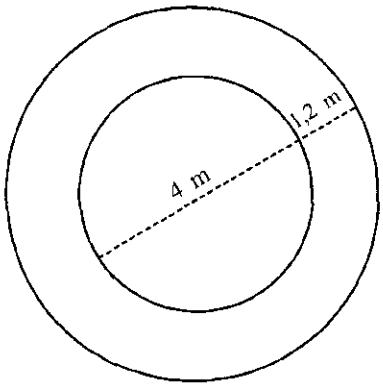
[2] 471 ℓ

[3] 1 885 ℓ

[4] 1 884 956 ℓ

Question 11

A fish pond is in the form of a circle with a diameter of 4 m A circular path around the pond is 1,2 m wide Calculate the area of the path which need to be paved Determine the answer rounded to one decimal digit



[1] 8,7 m^2

[2] 78,4 m^2

[3] 19,6 m^2

[4] 34,7 m^2

Question 12

If $A = \frac{1}{2}b \times h$ make h the subject of the formula

[1] $h = \frac{A}{2b}$

[2] $h = \frac{2A}{b}$

[3] $h = \frac{Ab}{2}$

[4] $h = 2Ab$

Question 13

If $S = \frac{a}{1-r}$, make r the subject of the formula

[1] $r = S - a$

[2] $r = a - S - 1$

[3] $r = \frac{a}{S} - 1$

[4] $r = \frac{S-a}{S}$

Question 14

A manufacturer produces 32 chairs per day The daily fixed cost is R1 200 and the cost of producing one chair is R50 Suppose he sells all the chairs he produces per day and makes a profit of R2 000 per day His selling price per chair is

[1] R62,50

[2] R101,56

[3] R112,50

[4] R150 00

Question 15

Determine the LCM (least common multiple) of the following

$$8x^2y^2,\ 14xy^2,\ 12xy^3$$

[1] $14x^2y^3$

[2] $28xy^3$

[3] $168x^2y^3$

[4] $2xy$

Question 16

Simplify each of the following

$a = \frac{2}{3} - \frac{1}{6} + \frac{1}{5}$

$b = \frac{3}{4} - \frac{1}{2} \times \frac{5}{4}$

$c = \frac{5}{2} - \frac{9}{8} \times \frac{4}{3}$

Pick the option with all three answers correct

[1] $a = 1, \quad b = 1\frac{7}{8}, \quad c = 1\frac{9}{22}$
[2] $a = \frac{7}{10}, \quad b = 1\frac{7}{8}, \quad c = 1$
[3] $a = \frac{7}{10}, \quad b = 1\frac{1}{5}, \quad c = 1\frac{5}{6}$
[4] $a = \frac{3}{10}, \quad b = \frac{15}{48}, \quad c = 1\frac{9}{22}$

Question 17

The equation of the straight line passing through the points $(-2, -3)$ and $(1 \quad -2)$ is

[1] $y = \frac{1}{3}x - \frac{7}{3}$
[2] $y = 5x - 7$
[3] $y = -\frac{1}{3}x - \frac{11}{3}$
[4] $y = x - 1$

Question 18

A school had 1 200 learners in 2013 In 2014 the enrolment increased by 15% Determine the number of learners enrolled in 2014

[1] 1 215
[2] 1 380
[3] 180
[4] 1 020

Question 19

A school has 30 teachers If the ratio of the number of female teachers to the number of male teachers at the school is 3 2, how many male teachers are there at the school?

[1] 12
[2] 2
[3] 10
[4] 18

Question 20

What sum of money should be invested at 8% simple interest rate per year, to earn a total of R10 800 00 interest in three years? Give the answer to the nearest rand

[1] R450,00
[2] R8 710,00
[3] R8 573.00
[4] R45 000,00

Question 21

At what annual simple interest rate should R24 000 be invested to grow to R36 000 in 4 years?

[1] 0,125%
[2] 8,3%
[3] 12 5%
[4] 15%

Question 22

At what interest rate per year must R1 000 be invested so that the investment is worth R1 500 after 2 years? Interest is compounded quarterly Give the answer rounded to the first decimal digit

[1] 4.0%
[2] 10 4%
[3] 25,0%
[4] 20,8%

Question 23

An amount of R10 000 is invested at an annual interest rate of 12%, compounded every four months Find the value of the investment after 5 years

[1] R16 000
[2] R18 009,44
[3] R18 061,11
[4] R5 552,65

Question 24

Jacky bought a second hand car for R80 000 from a dealer in Pretoria She managed to secure a loan at an interest rate of 10,5% per year compounded monthly The term of the loan is 5 years Calculate Jacky's monthly payment

[1] R2 357,50
[2] R1 019,51
[3] R1 920,00
[4] R1 719,51

Question 25

Joseph bought a town house in Northriding Johannesburg for R700 000 He managed to secure a loan for the full amount at a fixed interest rate of 7 75% per year compounded monthly Calculate how many years it will take Joseph to pay off his loan if he makes monthly payments of R6 000 into this loan account Give the answer to one decimal digit correctly

[1] 18 1 years

[2] 217 5 years

[3] 7,3 years

[4] 9,7 years

TOTAL: 100

FORMULAS

$$C = 2(l + w)$$
$$C = 4l$$
$$C = a + b + c$$
$$C = 2\pi r$$

$$A = l \times w$$
$$A = l^2$$
$$A = \frac{1}{2}bh$$
$$A = \pi r^2$$

$$V = l^3$$
$$V = l \times base \times h$$
$$V = \pi r^2 h$$

$$y - y_1 = m(x - x_1)$$

$$\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$I = Prt$$

$$S = P(1 + rt)$$

$$S = P(1 + i)^n$$

$$P = Ra_{\overline{n}|i}$$

$$P = R\left[\frac{(1 + i)^n - 1}{i(1 + i)^n}\right]$$

$$S = Rs_{\overline{n}|i}$$

$$S = R\left[\frac{(1 + i)^n - 1}{i}\right]$$

ROUGH WORK

ROUGH WORK

ROUGH WORK

UNIVERSITY OF SOUTH AFRICA UNISA **UNIVERSITEIT VAN SUID-AFRIKA**

EXAMINATION MARK READING SHEET — EKSAMEN-MERKLEESBLAD

PART 1 (GENERAL/ALGEMEEN) DEEL 1

STUDY UNIT e.g. PSY100-X
STUDIE EENHEID bv. PSY100-X — 1

INITIALS AND SURNAME
VOORLETTERS EN VAN — 3

DATE OF EXAMINATION
DATUM VAN EKSAMEN — 4

PAPER NUMBER
VRAESTELNOMMER — 2

EXAMINATION CENTRE (E.G. PRETORIA)
EKSAMENSENTRUM (BV. PRETORIA) — 5

STUDENT NUMBER
STUDENTENOMMER — 6

UNIQUE PAPER NO
UNIEKE VRAESTEL NR — 8

For use by examination invigilator
Vir gebruik deur eksamenopsiener

IMPORTANT

1. USE ONLY AN HB PENCIL TO COMPLETE THIS SHEET
2. MARK LIKE THIS
3. CHECK THAT YOUR INITIALS AND SURNAME HAS BEEN FILLED IN CORRECTLY
4. ENTER YOUR STUDENT NUMBER FROM LEFT TO RIGHT
5. CHECK THAT YOUR STUDENT NUMBER HAS BEEN FILLED IN CORRECTLY
6. CHECK THAT THE UNIQUE NUMBER HAS BEEN FILLED IN CORRECTLY
7. CHECK THAT ONLY ONE ANSWER PER QUESTION HAS BEEN MARKED
8. DO NOT FOLD

BELANGRIK

1. GEBRUIK SLEGS 'N HB POTLOOD OM HIERDIE BLAD TE VOLTOOI
2. MERK AS VOLG
3. KONTROLEER DAT U VOORLETTERS EN VAN REG INGEVUL IS
4. VUL U STUDENTENOMMER VAN LINKS NA REGS IN
5. KONTROLEER DAT U DIE KORREKTE STUDENTENOMMER VERSTREK HET
6. KONTROLEER DAT DIE UNIEKE NOMMER REG INGEVUL IS
7. MAAK SEKER DAT NET EEN ALTERNATIEF PER VRAAG GEMERK IS
8. MOENIE VOU NIE

PART 2 (ANSWERS/ANTWOORDE) DEEL 2

10

1	c1 c2 c3 c4 c5	36	c1 c2 c3 c4 c5	71	c1 c2 c3 c4 c5	106	c1 c2 c3 c4 c5
2	c1 c2 c3 c4 c5	37	c1 c2 c3 c4 c5	72	c1 c2 c3 c4 c5	107	c1 c2 c3 c4 c5
3	c1 c2 c3 c4 c5	38	c1 c2 c3 c4 c5	73	c1 c2 c3 c4 c5	108	c1 c2 c3 c4 c5
4	c1 c2 c3 c4 c5	39	c1 c2 c3 c4 c5	74	c1 c2 c3 c4 c5	109	c1 c2 c3 c4 c5
5	c1 c2 c3 c4 c5	40	c1 c2 c3 c4 c5	75	c1 c2 c3 c4 c5	110	c1 c2 c3 c4 c5
6	c1 c2 c3 c4 c5	41	c1 c2 c3 c4 c5	76	c1 c2 c3 c4 c5	111	c1 c2 c3 c4 c5
7	c1 c2 c3 c4 c5	42	c1 c2 c3 c4 c5	77	c1 c2 c3 c4 c5	112	c1 c2 c3 c4 c5
8	c1 c2 c3 c4 c5	43	c1 c2 c3 c4 c5	78	c1 c2 c3 c4 c5	113	c1 c2 c3 c4 c5
9	c1 c2 c3 c4 c5	44	c1 c2 c3 c4 c5	79	c1 c2 c3 c4 c5	114	c1 c2 c3 c4 c5
10	c1 c2 c3 c4 c5	45	c1 c2 c3 c4 c5	80	c1 c2 c3 c4 c5	115	c1 c2 c3 c4 c5
11	c1 c2 c3 c4 c5	46	c1 c2 c3 c4 c5	81	c1 c2 c3 c4 c5	116	c1 c2 c3 c4 c5
12	c1 c2 c3 c4 c5	47	c1 c2 c3 c4 c5	82	c1 c2 c3 c4 c5	117	c1 c2 c3 c4 c5
13	c1 c2 c3 c4 c5	48	c1 c2 c3 c4 c5	83	c1 c2 c3 c4 c5	118	c1 c2 c3 c4 c5
14	c1 c2 c3 c4 c5	49	c1 c2 c3 c4 c5	84	c1 c2 c3 c4 c5	119	c1 c2 c3 c4 c5
15	c1 c2 c3 c4 c5	50	c1 c2 c3 c4 c5	85	c1 c2 c3 c4 c5	120	c1 c2 c3 c4 c5
16	c1 c2 c3 c4 c5	51	c1 c2 c3 c4 c5	86	c1 c2 c3 c4 c5	121	c1 c2 c3 c4 c5
17	c1 c2 c3 c4 c5	52	c1 c2 c3 c4 c5	87	c1 c2 c3 c4 c5	122	c1 c2 c3 c4 c5
18	c1 c2 c3 c4 c5	53	c1 c2 c3 c4 c5	88	c1 c2 c3 c4 c5	123	c1 c2 c3 c4 c5
19	c1 c2 c3 c4 c5	54	c1 c2 c3 c4 c5	89	c1 c2 c3 c4 c5	124	c1 c2 c3 c4 c5
20	c1 c2 c3 c4 c5	55	c1 c2 c3 c4 c5	90	c1 c2 c3 c4 c5	125	c1 c2 c3 c4 c5
21	c1 c2 c3 c4 c5	56	c1 c2 c3 c4 c5	91	c1 c2 c3 c4 c5	126	c1 c2 c3 c4 c5
22	c1 c2 c3 c4 c5	57	c1 c2 c3 c4 c5	92	c1 c2 c3 c4 c5	127	c1 c2 c3 c4 c5
23	c1 c2 c3 c4 c5	58	c1 c2 c3 c4 c5	93	c1 c2 c3 c4 c5	128	c1 c2 c3 c4 c5
24	c1 c2 c3 c4 c5	59	c1 c2 c3 c4 c5	94	c1 c2 c3 c4 c5	129	c1 c2 c3 c4 c5
25	c1 c2 c3 c4 c5	60	c1 c2 c3 c4 c5	95	c1 c2 c3 c4 c5	130	c1 c2 c3 c4 c5
26	c1 c2 c3 c4 c5	61	c1 c2 c3 c4 c5	96	c1 c2 c3 c4 c5	131	c1 c2 c3 c4 c5
27	c1 c2 c3 c4 c5	62	c1 c2 c3 c4 c5	97	c1 c2 c3 c4 c5	132	c1 c2 c3 c4 c5
28	c1 c2 c3 c4 c5	63	c1 c2 c3 c4 c5	98	c1 c2 c3 c4 c5	133	c1 c2 c3 c4 c5
29	c1 c2 c3 c4 c5	64	c1 c2 c3 c4 c5	99	c1 c2 c3 c4 c5	134	c1 c2 c3 c4 c5
30	c1 c2 c3 c4 c5	65	c1 c2 c3 c4 c5	100	c1 c2 c3 c4 c5	135	c1 c2 c3 c4 c5
31	c1 c2 c3 c4 c5	66	c1 c2 c3 c4 c5	101	c1 c2 c3 c4 c5	136	c1 c2 c3 c4 c5
32	c1 c2 c3 c4 c5	67	c1 c2 c3 c4 c5	102	c1 c2 c3 c4 c5	137	c1 c2 c3 c4 c5
33	c1 c2 c3 c4 c5	68	c1 c2 c3 c4 c5	103	c1 c2 c3 c4 c5	138	c1 c2 c3 c4 c5
34	c1 c2 c3 c4 c5	69	c1 c2 c3 c4 c5	104	c1 c2 c3 c4 c5	139	c1 c2 c3 c4 c5
35	c1 c2 c3 c4 c5	70	c1 c2 c3 c4 c5	105	c1 c2 c3 c4 c5	140	c1 c2 c3 c4 c5