



**UNIVERSITY OF JOHANNESBURG**  
**FACULTY OF EDUCATION**  
**JULY EXAMINATION 2018**

**PROGRAMME:** B Ed Intermediate Phase programme

**MODULE:** Mathematics for the Foundation Phase & Introduction to Mathematics for  
the Intermediate Phase

**CODE:** MFP10A1 & MATINA1

**TIME:** 2 hours 30minutes

**MARKS:** 100

**EXAMINERS:** Mrs K Fonseca

**MODERATOR:** Prof C Long

(This paper consists of 6 pages)

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**INSTRUCTIONS:**

Read the following instructions carefully before answering the questions.

1. This question paper consists of 5 questions.
2. Answer all the questions.
3. Number the questions correctly as in the question paper.
4. Read each question carefully before answering.
5. Show ALL working out.
6. You may **NOT** use a calculator.
7. Write **NEATLY** and **LEGIBLY**.

**Question 1: Multiple Choice****8 marks**

1.1 Mary writes  $2^{-3}$  on the board, which of the following expressions are another way to use repeated multiplication? (1)

A.  $2 \times -3$

B.  $-3 \times -3$

C.  $2 \times 2 \times 2$

D. 
$$\frac{2 \times 2}{2 \times 2 \times 2 \times 2 \times 2}$$

1.2 Which of the following is the prime factorization of 72? (1)

A.  $2^3 \cdot 3^2$

B.  $2^4 \cdot 3^3$

C.  $8 \cdot 3^2$

D.  $2^3 \cdot 9$

1.3 We are two natural numbers. Our difference is 30, and our greatest common factor is 15, and our sum is 120. (1)

Who are we?

A. 15 and 30 since our greatest common factor is 15

B. 15 and 45, since our difference is 30 and our greatest common factor is 15.

C. 15 and 105, since our sum is 120 and our greatest common factor is 15.

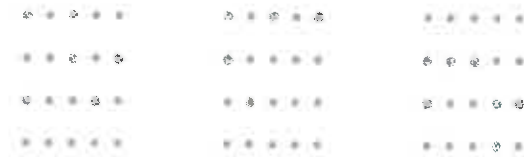
D. 45 and 75, since our difference is 30 and our greatest common factor is 15.

1.4 Four chocolates and two cooldrinks cost, R35, while two cooldrinks and four chocolates cost R43. What does one cooldrink and one chocolate cost? (1)

A. R11

- B. R12
- C. R13
- D. R16

1.5 Which expression fits the diagram below? (1)



- A.  $4 \times 5 \times 5$
- B.  $3 \times (3 \times 4)$
- C.  $3 + (3 \times 4)$
- D.  $3 + (3 + 4)$

1.6 The first odd number is 1, the second is 3 and the third one is 5. What is the 100<sup>th</sup> odd number? (1)

- A. 99
- B. 201
- C. 199
- D. 101

1.7 Divide: (1)

$$0.003 \overline{)15.45}$$

- A. 0,515
- B. 5,15
- C. 5150
- D. 515

1.8  $2 \times (6 + 8) + 8 \times (6 + 8)$  (1)

A. 140

B. 76

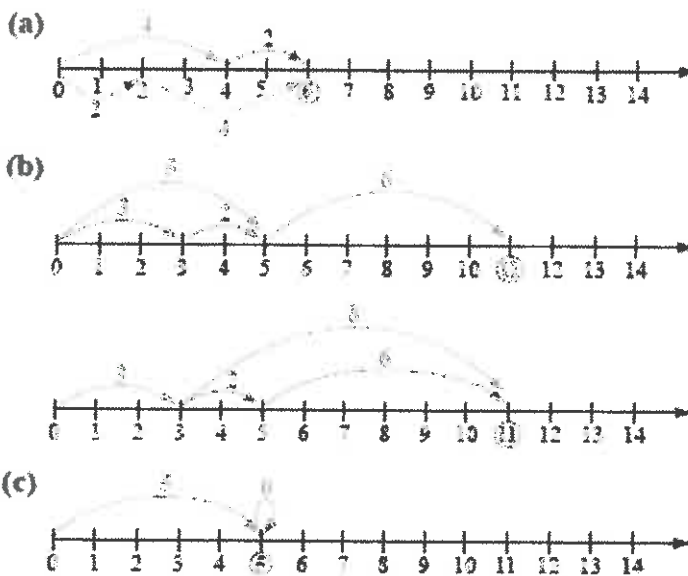
C. 96

D. 38

## Question 2

20 marks

2.1 What properties of whole-number addition are shown on the following number lines? (3)



2.2 State the property that was used in the equations. (3)

2.2.1  $(3 \times 8) \times 10 = 3 \times (8 \times 10)$

2.2.2  $5(3 - 2) = (5 \times 3) - (5 \times 2)$

2.2.3  $13 + 7 = 7 + 13$

2.3 Use easy combinations to perform these calculations: Show all working out

2.3.1  $35 + 7 + 15 =$  (3)

2.3.2  $47 \times 5 =$  (2)

2.4 Use adjustments in mental calculations to perform these calculations:

2.4.1  $286 + 347 =$  (3)

2.5 Suppose that Lisa told you that "Ben and I started out with the same number of sweets, but I gave him one of mine. Now Ben has one more sweet than me."

2.5.1 Why is Lisa's reasoning incorrect? (2)

2.5.2 How can you address Lisa's misconception? (3)

### Question 3

**22 marks**

3.1.1 Estimate the answer by rounding the numbers off to the nearest 10 000: (2)

$$62\,403 - 24\,812 \approx$$

3.1.2 Calculate the actual solution to 3.1.1. Use the expanded notation. (4)

3.1.3 Check the solution to 3.1.2 by using the inverse operation. Use the column-method (3)

3.2 Calculate the following:

3.2.1  $1\,24 \times 75 =$ , using the lattice-method (4)

3.2.2 Find the quotient  $q$  and the remainder  $r$  if  $a = bq + r$  where (3)

$$a = 723 \text{ and } b = 21$$

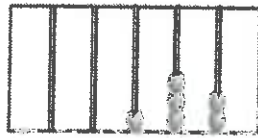
3.3 Ziggy is having trouble multiplying two-digit numbers. She is good in art so you are trying to teach her a visual method for multiplication. Draw a rectangular-area-model for  $125 \times 37$  (3)

- 3.4 Explain how you will teach your class the Multiplication-by-zero-property. (3)

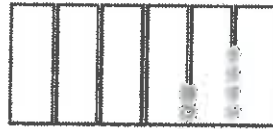
#### Question 4

27 marks

- 4.1 In the following two diagrams the abacuses represent base-five numbers.



(a)



(b)

- 4.1.1 What base-five numbers are represented by the beads in the abacuses above? (2)
- 4.1.2 Write base-ten representations of the base-five numbers in 3.1.1 (a & b) (2 x 2)
- 4.1.3 Suppose the number shown in abacus (b) is increased by 9. Draw a diagram to show how the number will be represented. (3)

- 4.2 Write the base-ten representation of the following number: (2)

$$2134_{\text{six}}$$

- 4.3.1 Determine the base-five representation of the given number. Remember that a numeral with no subscript is understood to be in base ten. (2)

$$1554$$

- 4.3.2 Determine the base-six representation of the given number. (2)

$$216$$

- 4.4 Perform the given calculations in the respective base notation given.

- 4.4.1
- $$\begin{array}{r} 304_{\text{five}} \\ + 334_{\text{five}} \\ \hline \end{array}$$
- (3)

4.4.2

$$\begin{array}{r} 423_{six} \\ - 43_{six} \\ \hline \end{array}$$

(3)

4.5 Explain how you would respond to one of your learners who claims that the base-six representation of  $267_{ten}$  is  $723_{six}$ . (4)

4.6 What is the main difference and main similarity between the base-ten number system and the base five and six number system? (2)

### Question 5

23 marks

5.1 Determine whether each of the following statements is TRUE or FALSE. Give a reason for each other.

5.1.1 5 divides  $2\,439 + 8\,206$  (2)

5.1.2 Since both 2 and 4 are divisors of  $54\,628$ , 8 is also a divisor, because  $2 \times 4 = 8$  (2)

5.2 Musa claims that 15 does not divide  $177 + 48$ , since 15 does not divide 177 and 15 does not divide 48.

5.2.1 Is Musa correct? (1)

5.2.2 Explain how you would respond to Musa's thinking. (3)

5.3 State the Fundamental Theorem of Arithmetic (3)

5.4 Is 371 a prime number? Explain how you established whether it's a prime or not. (3)

5.5 Determine the HCF of 504 and 3 675 (3)

5.6 In a village, the bell rings every 30 minutes at the Junior School and every 40 minutes at the High School. Both schools start at 08:00 a.m.

5.6.1 At what times between 08:00 a.m. and 2:30 p.m. do both bells ring at the same time? (4)

5.6.2 If the High School bell rings every 45minutes, how many times during the school day would this bell ring at the same time as the Junior School bell? (2)

