



The National
Orthodox School
Shmaisani

Mark

40

Subject: Mathematics

Second Exam / First Semester

Name: Answers

Grade-Section: 8 CS ()

Date:

Duration: 1 hour

READ THESE INSTRUCTIONS FIRST.

Write candidate name, class and section in the spaces provided above.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, and glue or correction fluid.

Number of pages: 7

Answer all questions. Number of questions: 6

The number of marks is given at the beginning of each question or part question.

QUESTION NUMBER	MARK SCHEME
1	8
2	4
3	7
4	11
5	4
6	6
TOTAL	40

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Question 1

8 marks

Sort the following numbers into one of these three groups.

Put a tick (✓) in the correct box.

Number	Rational	Irrational	Not rational or irrational
15π		✓	
$-\sqrt{12}$		✓	
$\sqrt{-16}$			✓
$\sqrt[3]{-125}$	✓		
- 81	✓		
$\sqrt[3]{27}$	✓		
0.13	✓		
$7\frac{1}{10}$	✓		

Question 2

4 marks

The area of a square is 58 cm^2 . Estimate its side length to the nearest millimeter. Show all the steps of your working.

$$\text{Area}_{\text{square}} = L^2$$

$$L_{\text{square}} = \sqrt{\text{Area}}$$

$$L_{\text{square}} = \sqrt{58}$$

$$\sqrt{49}$$

7

$$\sqrt{58}$$

$$\sqrt{64}$$

8

$$58 - 49 = 9$$

$$64 - 49 = 15$$

$$\frac{9}{15} = 0.6$$

$$7 + 0.6 = 7.6$$

$$\sqrt{58} \approx 7.6 \text{ cm} \xrightarrow{\times 10} 76 \text{ mm}$$

Question 3

7 marks

Fill in the boxes:

a) $\times 10^2 = 89$

b) $1178 \div$ $= 0.1178$

c) $\times 10^{-4} = 9$

d) $0.0321 \times$ $= 3210$

e) $5800 \times 10^{-2} + 0.07 \div 10^{-3} =$

$+$ $=$

Question 4

11 marks

Simplify using index laws. Show all the steps of your working and leave your answer in positive index form.

$$\text{a) } 6^{12} \times 6^5 = 6^{12+5} = 6^{17} \quad (1 \text{ mark})$$

$$\text{b) } 5^8 \div 5^5 = 5^{8-5} = 5^3 \quad (1 \text{ mark})$$

$$\text{c) } 14^7 \div 14^{-2} = 14^{7-(-2)} = 14^{7+2} = 14^9 \quad (1 \text{ mark})$$

$$\text{d) } 13^7 \times 13^{-7} = 13^{7+(-7)} = 13^0 = 1 \quad (1 \text{ mark})$$

$$\text{e) } \left(-\frac{5}{100}\right)^0 = 1 \quad (1 \text{ mark})$$

$$f) \frac{(5^1 \times 5^4)^4}{5^{10}} = \frac{5^{5 \times 4}}{5^{10}} = 5^{20-10} = 5^{10} \quad (3 \text{ marks})$$

$$g) \frac{(2^2 \times 2^3)^2}{(2^{20} \div 2^2)} = \frac{2^{5 \times 2}}{2^{18}} = \frac{2^{10}}{2^{18}} = 2^{-8} = \frac{1}{2^8} \quad (3 \text{ marks})$$

Question 5

4 marks

A) Write in standard form:

(2 marks)

a) 465 000 000 = 4.65×10^8

b) 0.0987 = 9.87×10^{-2}

B) The mass of an oxygen atom is 2.7×10^{-23} grams. What is this in kilograms? Give your answer in standard form. (2 marks)

$$2.7 \times 10^{-23} \text{ g} \xrightarrow{\div 10^3} 2.7 \times 10^{-26} \text{ kg}$$

Question 6

6 marks

Write an inequality to show the upper and lower bounds for a number, n , where n is:

- a) 18.25 rounded correct to the nearest 2 d.p.

$$0.01 \div 2 = 0.005$$

$$18.25 - 0.005 = 18.245$$

$$18.25 + 0.005 = 18.255$$

$$\boxed{18.245} \leq n < \boxed{18.255}$$

- b) 5000 rounded correct to the nearest 1 s.f.

$$\underline{5000}$$

$$1000 \div 2 = 500$$

$$5000 - 500 = 4500$$

$$5000 + 500 = 5500$$

$$\boxed{4500} \leq n < \boxed{5500}$$

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