Exponent Laws & Exponential Equations (Grade 11)

EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
36	55 minutes	3

Name: _____ Class: _____

Date: _____

MARK ____ / 36

INSTRUCTIONS AND INFORMATION

1. Answer **ALL** the questions in this question paper.
2. Answer QUESTION 1 by **circling** the letter (A–D) in the answer grid at the end of that section.
3. Show **ALL** calculations clearly.
4. Show all units where applicable.
5. Number the answers correctly according to the numbering system used in this question paper.
6. A non-programmable calculator may be used, unless stated otherwise.
7. Write neatly and legibly.

QUESTION 1 [10 MARKS]

Four options are given as possible answers to the following questions. Choose the correct answer and circle the letter (A–D) in the grid at the end of this section. If you want to change your choice, put a cross through the wrong letter and circle your new choice.

1.1 $\frac{2^{x+1}}{2^{x-1}} = \ldots$ (1)

A) 4 **B)** 2

C) 2^{2x} **D)** 1

1.2 If $3^{2x} = 27$, then $x = \ldots$ (1)

A) 3 **B)** 1,5

C) 0,5 **D)** 9

1.3 $\frac{9^x}{3^{x-1}} = \ldots$ (1)

A) 3^{2x} **B)** 3^{x+1}

C) 3^{x-1} **D)** 6^{x+1}

1.4 Solve for x: $2^{2x} - 5(2^x) + 4 = 0$ (1)

A) $x = 0$ or $x = 2$ **B)** $x = 2$ only

C) $x = 5$ or $x = 4$ **D)** $x = 1$ or $x = 4$

1.5 $16^{\frac{3}{4}} = \ldots$ (1)

A) 2 **B)** 64

C) 8 **D)** 12

1.6 $\frac{5^{x+2}}{5^x} = \ldots$ (1)

A) 5 **B)** 5^{2x+2}

C) 10 **D)** 25

1.7 Solve for x: $3^{x+1} = 9^{x-1}$ (1)

A) $x = 2$ **B)** $x = 1$

C) $x = 3$ **D)** $x = -3$

1.8 $\frac{2^x \times 4^x}{8^x} = \ldots$ (1)

A) 1 **B)** 0

C) 2^{3x} **D)** 2^x

1.9 If $2^x = 5$, then $2^{x+3} = \ldots$ (1)

A) 15 **B)** 125

C) 8 **D)** 40

1.10 For $x > 0$, $\sqrt{x} \times x^{½} = \ldots$ (1)

A) x^2 **B)** $x^{\frac{1}{4}}$

C) $\sqrt{x}$ **D)** x

ANSWER GRID — CIRCLE YOUR ANSWERS FOR QUESTION 1

1.1	A	B	C	D
1.2	A	B	C	D
1.3	A	B	C	D
1.4	A	B	C	D
1.5	A	B	C	D
1.6	A	B	C	D
1.7	A	B	C	D
1.8	A	B	C	D
1.9	A	B	C	D
1.10	A	B	C	D

QUESTION 2 [12 MARKS]

Simplify the following WITHOUT the use of a calculator.

2.1 $\left(\frac{8}{27}\right)^{-\frac{2}{3}}$ **(4)**

2.2 $\frac{3^{x+1} - 3^x}{3^x}$ **(4)**

2.3 $\frac{2^{x+2} + 2^x}{5 \times 2^x}$ **(4)**

QUESTION 3 [14 MARKS]

Solve for x.

3.1 $3^{2x} - 4(3^x) + 3 = 0$ **(5)**

3.2 $5^{x+2} - 5^x = 600$ **(4)**

3.3 Explain why $2^x = -4$ has no solution. **(2)**

3.4 Show, without a calculator, that $2^{10} \times 5^{10} = 10^{10}$. **(3)**

TOTAL: 36 marks

This question paper consists of 3 questions.

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