Laws of Exponents & Rational Exponents (Grade 10)

MEMORANDUM

Name: ..... Class: .....

Date: .....

MARK ____ / 22

Answer all questions. Show all your working — marks are awarded for method as well as the final answer. **Teacher copy: accept any correct equivalent method.**

1 Simplify: $x^7 \times x^{-3}$ **(1)**

x^4 ✓ (1)

2 Simplify: $(2x^3)^4$ **(2)**

$16x^{12}$ ✓✓ (2)

3 Calculate: 5^{-2} **(1)**

$\frac{1}{25}$ ✓ (1)

4 Calculate: $9^{\frac{1}{2}}$ **(1)**

3 ✓ (1)

5 Calculate: $8^{\frac{2}{3}}$ **(2)**

$(\sqrt[3]{8})^2 = 2^2 = 4$ ✓✓ (2)

6 Calculate: $27^{\frac{2}{3}}$ **(2)**

$(\sqrt[3]{27})^2 = 3^2 = 9$ ✓✓ (2)

7 Calculate: $16^{\frac{3}{4}}$ **(2)**

$(\sqrt[4]{16})^3 = 2^3 = 8$ ✓✓ (2)

8 Calculate: $16^{-\frac{3}{4}}$ **(2)**

$\frac{1}{8}$ ✓✓ (2)

9 Simplify: $\frac{2^{x+3}}{2^x}$ **(2)**

> $2^3 = \mathbf{8}$ ✓✓ (2)

10 Solve: $2^x = 64$ **(2)**

> $64 = 2^6 \rightarrow \boldsymbol{x = 6}$ ✓✓ (2)

11 Solve: $3^{x+1} = 27$ **(2)**

> $x + 1 = 3 \rightarrow \boldsymbol{x = 2}$ ✓✓ (2)

12 Solve: $5^{2x} = 125$ **(3)**

> $2x = 3 \rightarrow \boldsymbol{x = 1{,}5}$ ✓✓✓ (3)

TOTAL: 22 marks

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