TB(2B) Ch. 8 Laws of integral indices
Conventional Questions

1. [13-14 S.2 S.Test, 2]

Without using a calculator, find the value of $60\times10^{-2014}-2\times10^{-2013}$ and express your answer in scientific notation. **(2 marks)**

2. [13-14 S.2 S.Test, 5]

Simplify $\dfrac{(-5x^{-2}y^{3})^{-2}}{(x-y)^{0}(2x^{2}y^{-3})^{3}}$ and express the answer with positive indices. **(3 marks)**

3. [13-14 S.2 S.Test, 7]

Solve $(3^{2^{n-1}}+1)(3^{2^{n-1}}-1)=80$ for n. **(3 marks)**

4. [13-14 Final Exam, #3]

(a) Simplify $\dfrac{\left(a^{2}b^{-3}\right)^{2}}{\left(2a^{-2}b^{2}\right)^{-3}}$ and express the answer with positive indices. **(2 marks)**

(b) Solve $5^{n+1}\cdot5^{3n}=1$ for n. **(2 marks)**

5. [14-15 Standardized Test #4]

It is given that the storage of the harddisk is 2 TB and a digital song occupies 4 MB. Assume that 1 TB = 2^{20} MB, how many digital songs can the harddisk store? Round off your answer to 3 significant figures and express it in scientific notations. **(2 marks)**

6. [14-15 Standardized Test #8]

Solve $\left(-3^{2n-3}\right)^{-1}+\dfrac{21}{9^{n-1}}=2$. **(3 marks)**

7. [14-15 S.6 Mock Exam #1]

Simplify $b^{12}\left(\dfrac{3a^{-4}}{b^{5}}\right)^{-2}$ and express your answer with positive indices. **(3 marks)**

8. [14-15 Final Exam #12]

(a) Simplify $\left(\dfrac{-2a^{3}b}{3ab^{3}}\right)^{-4}$ and express the answer with positive indices. **(2 marks)**

(b) Solve $9\cdot2^{2x}+4^{x}=40$. **(2 marks)**

9. [15-16 Final Exam #9]

Simplify $\left(\frac{4x^{-2}y}{-7x^{0}y^{-5}}\right)^{-4}$ and express the answer with positive indices. **(2 marks)**

10. [15-16 S.6 Mock Exam #1]

Simplify $\frac{b^{-4}}{(a^{-3}b^{4})^{2}}$ and express your answer with positive indices. **(3 marks)**

11. [15-16 Standardized Test #2]

Simplify $\frac{a^{-3}b^{-1}\times\left(-2a^{2}b^{-3}\right)^{2}}{\left(3a^{-1}b^{2}\right)^{-1}}$ and express the answer with positive indices. **(3 marks)**

12. [15-16 Standardized Test #3]

Find the value of $3\times10^{2013}+6\times10^{2015}$ without using a calculator, and express the answer in scientific notation. **(2 marks)**

13. [15-16 Standardized Test #6]

Solve the equation $9^{x}+26\times9^{-1}=3^{2x+3}$. **(2 marks)**

14. [16-17 S.6 Mock Exam #1]

Simplify $\frac{\left(a^{-4}b^{3}\right)^{5}}{a^{3}b^{-4}}$ and express your answer with positive indices. **(3 marks)**

15. [15-16 Final Exam #9]

Simplify $\left(\frac{4x^{-2}y}{-7x^{0}y^{-5}}\right)^{-4}$ and express the answer with positive indices. **(2 marks)**

16. [16-17 Standardized Test #1]

Simplify $\left(\frac{x}{x^{-3}}\right)^{2}\times3x^{0}$ and express the answer with positive indices. **(2 marks)**

17. [16-17 Standardized Test #6]

(a) Express 0.000347×10^{103} in scientific notation. **(1 mark)**
(b) Express $AB.CD_{16}$ in expanded form. **(1 mark)**
(c) Write 100010000.0001_{2} as a hexadecimal number. **(1 mark)**

18. [16-17 Standardized Test #10]

Solve the equation $3^{x+1} = 2 \times 3^x + 3$. **(2 marks)**

19. [16-17 Final Exam #4]

Simplify $\dfrac{(x^3y^4)^2}{x^8y^{-3}}$ and express the answer with positive indices. **(3 marks)**

20. [17-18 Standardized Test 2 #1]

Simplify $\dfrac{\left(m^3n^{-2}\right)^{-4}}{4m^{-3}n^2}$ and express your answer with positive indices. **(3 marks)**

21. [17-18 Standardized Test 2 #6]

(a) Convert $2E.4_{16}$ into a denary number. **(1 mark)**

(b) Convert $2E.4_{16} \times 20_{10}$ into a binary number by the method of short division. **(2 marks)**

Short Division

22. [17-18 Standardized Test 2 #7]

(a) Calculate $\left(\dfrac{8100 \times 10^n}{0.000\ 000\ 000\ 000\ 027}\right)^3$ and express your answer in scientific notation in terms of n. **(3 marks)**

(b) Calculate the **exact value** of $9\ 000\ 060 \times 40\ 005\ 007$. **(2 marks)**
(Hint : Consider the expanded form.)

23. [17-18 Final Exam #1]

Simplify $\dfrac{\left(x^2y^{-2}\right)^5}{\left(3x^3y\right)^2}$ and express your answer with positive indices. **(3 marks)**

24. [17-18 Final Exam #11]

Solve $27^{n+1} - 18\left(27^{n}\right) = 243$. **(2 marks)**

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