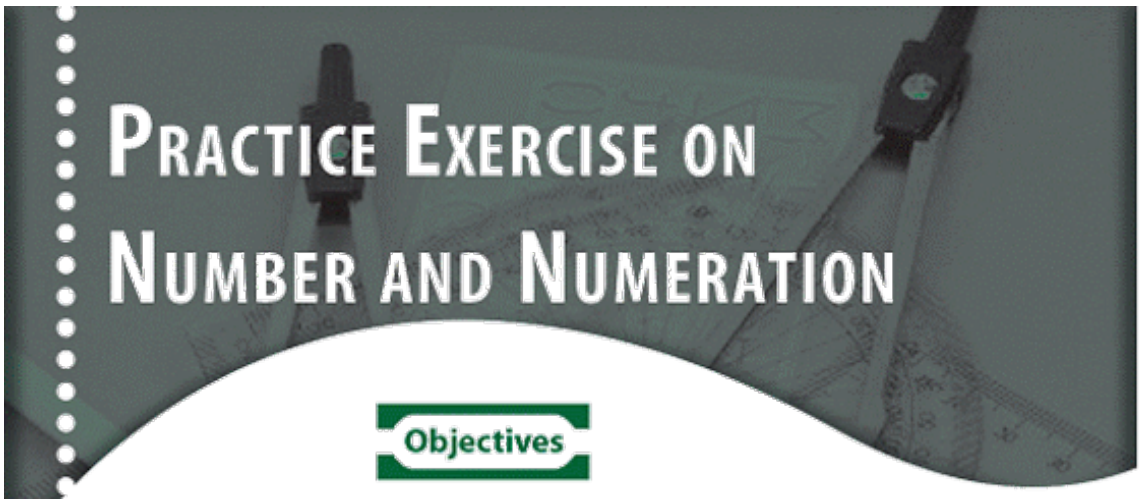
PRACTICE EXERCISE ON NUMBER AND NUMERATION



At the end of the chapter, students should be able to:
1. Use the laws of indices in simplifying problems involving indices.
2. Use logarithm tables to solve problems involving logarithms.
3. Identify the pattern of sequences and find any term.
4. Calculate percentages.

1. Without using mathematical tables, find x, given that $6\log(x+4) = \log 64$. **(WAEC)**

2. Derive an equation whose coefficients are integers and which has $\frac{1}{2}$ and -7 as its roots. **(WAEC)**

3. Three years ago, a father was four times as old as his daughter is now. The product of their present ages is 430. Calculate the present ages of the daughter and father? **(WAEC)**

4. If $3^{2x} = 27$, what is x? **(WAEC)**

5. Simplify $\frac{0.016 \times 0.084}{0.48}$ (leaving your answer in standard form). **(WAEC)**

6. Express 0.00562 in standard form.

7. Simplify (a) $2\frac{2}{3}-\left(2\frac{1}{2}-1\frac{4}{5}\right)$

(b) $\frac{3.25-1.64}{2.47-2.01}$ **(WAEC)**

8. (a) Using logarithm table, evaluate $\frac{3\sqrt{1.376}}{4\sqrt{0.007}}$ correct to three significant figures.

(b) Without using mathematical tables, find the value of $\frac{\log 81}{\log \frac{1}{3}}$.

9. (a) Solve this equation correct to two decimal places: $2x^2 + 7x - 11 = 0$.

(b) Using the substitution $P = \frac{1}{x}$ and $p = \frac{1}{y}$, solve the simultaneous equations:
$\frac{2}{x} + \frac{1}{y} = 3; \frac{1}{x} - \frac{5}{y} = 7$. **(WAEC)**

10. A man bought 5 reams of duplicating paper, each of which was supposed to contain 480 sheets. The actual number of sheets in the packets were 435, 420, 405, 415 and 440.
    (a) Calculate, correct to the nearest whole number, the average percentage error of the packets of paper.
    (b) If the agreed price of a full ream was ₦35.00, find, correct to the nearest naira, the amount in which the buyer was cheated. **(WAEC)**

11. (a) $9^{2x+1} = \frac{81^{x-2}}{3x}$, find x.
    (b) Without using mathematical tables, evaluate $\sqrt{\frac{0.81 \times 10^{-3}}{2.25 \times 10^{7}}}$. **(WAEC)**

12. (a) Solve the following pair of simultaneous equations: $2x + 5y = 6\frac{1}{2}$; $5x - 2y = 9$.
    (b) If $\log10(2x + 1) - \log10(3x - 2) = 1$, find x. **(WAEC)**

13. (a) If $17x = 375^2 - 356^2$, find the exact value of x.

    (b) If $4x = 2\frac{1}{2} \times 8$, find x. **(WAEC)**

14. A number is made up of two digits. The sum of the digits is 11. If the digits are interchanged, the original number is increased by 9. Find the number. **(WAEC)**

15. Divide 11111111_2 by 101_2. **(WAEC)**

16. A shopkeeper buys 40 kg of fruits for ₦120.00. He sells 20 kg of fruits for ₦120.00. He sells 20 kg at ₦5.00 per kg, 10 kg at 3.00 per kg, 5 kg at ₦2.00 per kg and the remaining 5 kg at 50k per kg. Calculate the

(a) Amount he realises from the sales.

(b) Total profit.

(c) Percentage profit on his outlay of ₦120.00. **(WAEC)**

17. Find the number which is exactly half-way between $1\frac{6}{7}$ and $2\frac{11}{29}$. **(WAEC)**

18. Simplify:

(a) $(+3) \times (-5)$

(b) $(+6) \times (-12)$

(c) $(-10) \times (-6)$

(d) $(-8) \times (+6)$

19. Write these numbers in full.

(a) 6.3 million

(b) 0.45 million

(c) 9.65 million

(d) 0.055 billion

(e) 0.48 million

20. Find two fractions which are equivalent to the following fractions:

(a) $\frac{1}{5}$ (b) $\frac{3}{5}$

(c) $\frac{3}{4}$ (d) $\frac{5}{7}$

21. Simplify the following:

(a) $4\frac{3}{7} + 5\frac{1}{6}$ (b) $4\frac{2}{5} - 2\frac{1}{5}$

(c) $6\frac{5}{6} - 1\frac{5}{6}$ (d) $8\frac{3}{7} + 3\frac{2}{5}$

22. Write down the number represented by ( ).

(a) $( ) + 11 = 20$

(b) $-6 \times ( ) = -30$

(c) $-8 \times 6 = ( )$

(d) $( ) \times 5 = -40$

23. How many peanuts can I buy with ₦550.50k, if each costs ₦7.50k?

24. Convert the following to decimal fractions:

    (a) $\frac{3}{5}$ (b) $4\frac{2}{7}$

    (c) $3\frac{1}{3}$ (d) $4\frac{1}{5}$

25. Solve the following equations:

    (a) $\frac{1x}{4} = 12$

    (b) $\frac{x}{7} = \frac{5}{7}$

    (c) $-3\frac{1x}{2} = \frac{8}{3}$

    (d) $2x = 32$

26. When 42 is added to a certain number, the result is -12. What is the number?

27. Find the 4th term of each of the following:

    (a) 2, 4, 6, ___

    (b) 17, 12, 7, ___

    (c) 11, 13, 15, ___

    (d) 9, 9.5, 10, ___

28. Change the following to mixed fractions:

(a) $\frac{22}{7}$ (b) $\frac{29}{4}$

(c) $\frac{77}{6}$ (d) $\frac{26}{5}$

(e) $\frac{73}{4}$

29. Which of the numbers:

(a) 3, 8, 4, 5, 7 are factors of 32.

(b) 4, 9, 16, 3, 5 are factors of 72.

(c) 5, 7, 4, 3, 6 are factors of 60.

(d) 2, 3, 6 are factors of 6.

30. List all the factors of

(a) 50 (b) 20

(c) 90 (d) 80

(e) 44

31. A girl spends $\frac{1}{5}$ of her pocket money on peanuts, $\frac{1}{4}$ on sweets and the rest on chewing gum. What fraction did she spend on chewing gum?

32. Evaluate the following:
    (a) $4.7 \times 1\,000$
    (b) 0.0047×100
    (c) $435.5 \times 10\,000$
    (d) 0.07004×10^3
    (e) 5.7×10^{-2}

33. Express the following as decimal fractions:
    (a) $\frac{1}{4}$ (b) $\frac{2}{5}$
    (c) $\frac{3}{4}$ (d) $\frac{9}{10}$
    (e) $\frac{2}{3}$ (f) $\frac{5}{8}$

34. Evaluate the following:
    (a) 7.9×2 (b) 4.8×0.004
    (c) 0.94×1.5 (d) 0.725×0.9
    (e) 4.7×7.6 (f) 7.8×0.09
    (g) 0.81×1.5 (h) 0.93×0.09

35. Write in words:

(a) 972 114 (b) 5 856 715

(c) 777 644 (d) 540 007

(e) 47 154 (f) 880 147

36. Calculate the following:

(a) 4.26×5.8

(b) 5.562×0.76

(c) 0.000495×12.4

(d) 56.711×0.575

37. Calculate the following:

(a) $3.18 \div 0.2$ (b) $63.15 \div 0.3$

(c) $321.6 \div 1.6$ (d) $4055 \div 0.5$

(e) $1.21 \div 1.1$ (f) $55.50 \div 0.005$

38. Evaluate the following:
    (a) $r^{12} \div r^{-6}$
    (b) $10^{-8} \div 10^{4}$
    (c) $x^{9} \times x^{2}$
    (d) $c^{7} \times c^{-2}$
    (e) $y^{-3} \times y^{-6}$
    (f) $n^{6} \div n^{-4}$

39. Round off the following to the nearest centimetre:
    (a) 0.72 cm
    (b) 760.001 cm
    (c) 4.79 cm
    (d) 170.007 cm
    (e) 84.45 cm
    (f) 4.09 cm

40. Change the following to improper fractions:
    (a) $4\frac{1}{4}$ (b) $3\frac{2}{3}$
    (c) $4\frac{5}{6}$ (d) $7\frac{2}{5}$
    (e) $6\frac{1}{3}$ (f) $9\frac{3}{5}$

41. Simplify the following:
    (a) $(-7+\sqrt{3})(+7-\sqrt{3})$
    (b) $\sqrt{12} \times \sqrt{3}$
    (c) $\sqrt{2} \times \sqrt{6}$
    (d) $\sqrt{71} \times \sqrt{71}$
    (e) $\sqrt{61} \times \sqrt{61}$
    (f) $\dfrac{\sqrt{4} \times \sqrt{16}}{\sqrt{25} + \sqrt{100}}$

42. Find the multiplicative inverse of:
    (a) 17 (b) 11
    (c) -2 (d) $\frac{2}{3}$
    (e) -4

43. Express the following whole numbers as a product of prime factors:
    (a) 42 (b) 16
    (c) 72 (d) 98
    (e) 34

44. Find the common factors of
    (a) 18 and 15 (b) 24 and 36
    (c) 25 and 42 (d) 64 and 81
    (e) 49 and 63

45. Find the HCF of
    (a) 15 and 32 (b) 37 and 72
    (c) 45 and 60 (d) 20 and 40
    (e) 56 and 24

46. List all the prime numbers between
    (a) 31 and 41
    (b) 11 and 22
    (c) 18 and 29
    (d) 0 and 12
    (e) 47 and 61

47. Perform the following binary operations:
    (a) $110111_2 \div 101_2$
    (b) $1110_2 - 1101_2$
    (c) $100_2 + 11_2$
    (d) $1111_2 + 1001_2$
    (e) $100111_2 - 100011_2$
    (f) $1101_2 \times 100_2$

48. Express the following in standard form:
    (a) 75200 (b) 6409
    (c) 0.00757 (d) 0.000092
    (e) 15010009 (f) 970045
    (g) 575.4 (h) 16.7

49. Find the values of the following:
    (a) $\frac{3}{5}$ of ₦3
    (b) $\frac{3}{4}$ of 12 million
    (c) $\frac{5}{2}$ of 2 hr
    (d) $\frac{3}{2}$ of $\frac{13}{4}$ hr
    (e) $\frac{2}{7}$ of 4 weeks
    (f) $\frac{3}{10}$ of 5.6 km
50. Find the values of the following:
    (a) $\frac{1}{6}$ of ₦2 in kobo
    (b) $\frac{2}{7}$ of 4 weeks in days
    (c) $\frac{1}{3}$ of 3 km in metres
    (d) $\frac{1}{5}$ of 12 cm in mm.
51. Find the number of seconds in
    (a) $\frac{7}{10 \text{ min}}$
    (b) $\frac{1}{4 \text{ min}}$
    (c) $\frac{3}{8 \text{ min}}$
    (d) $\frac{3}{10 \text{ min}}$
    (e) $\frac{7}{20}$ of 2 min
    (f) $\frac{4}{15}$ of 2 min
52. Express the following decimal numbers as sums of multiples of 10:
    (a) 10 (b) 495
    (c) 665 (d) 4273
    (e) 5555 (f) 5
    (g) 857 (h) 56

53. Convert the following base 10 numbers to binary numbers:
    (a) 12 (b) 48
    (c) 17 (d) 105

54. If $23x = 1111_2$, find x **(WAEC)**

55. Convert 89_{10} to a number in base 2. **(WAEC)**

56. Divide 11111111_2 by 101_2. **(WAEC)**

57. Express 4020_6 as a number in base 10.

58. Express the binary number 101.111 as a number in base 10.

59. Convert 1110101_2 to a number in base 10.

60. If $n_x \times 111_2 = 1110_2$, find n.

61. Solve the following equations:
    (a) $x + 5 = -9$
    (b) $y - 2 = 4$
    (c) $8 - y = -9$
    (d) $-6 = 2 - y$

62. Given that $\frac{2}{x+3} - \frac{1}{x-2} = \frac{Px+Q}{2+x-6}$ where P and Q are constants, find P and Q. **(WAEC)**

63. If $x - y = 3$ and $2x + y = 12$, what is the value of $2x - y$? **(WAEC)**

64. Represent the following in roman numerals:
    (a) LXIX (b) CCCI
    (c) XLV (d) CIX
    (e) XLIX

65. Simplify:
    $(121 + 156) + 42 + 8 \times 4 - 25$.

66. Subtract 25 478 from 72 005.

67. Code the following:

(a) Mathematics is fun.

(b) Algebra is very simple.

(c) Mathematics involves problem-solving.

(d) Good afternoon everyone.

68. Simplify $\frac{8}{11} \times \frac{7}{11} - \frac{2}{5} + \frac{2}{5}$.

69. Convert the following percentages to fractions in their lowest form:

(a) $7\frac{2}{3}\%$ (b) $43\frac{1}{3}\%$

(c) 15% (d) 16%

(e) $45\frac{1}{2}\%$

70. Express the following ratios in their simplest forms:

(a) 48:42

(b) 27 days:14 days

(c) 51 cm:17 cm

(d) 1 litre:350 ml

(e) 36:81

(f) 20:24