1. $\frac{(-3)^{-9}}{(-3)^{8}}$ =

(i) $(-3)^{-16}$ (ii) $(-3)^{-15}$ (iii) $(-6)^{-17}$ (iv) $(-3)^{-17}$ (v) $(-3)^{-18}$

2. $\frac{\left(\frac{4}{3}\right)^{6}}{\left(\frac{4}{3}\right)^{-9}}$ =

(i) $\left(\frac{4}{3}\right)^{15}$ (ii) $\left(\frac{4}{3}\right)^{14}$ (iii) $\left(\frac{2}{3}\right)^{15}$ (iv) $\left(\frac{4}{3}\right)^{16}$ (v) 2^{15}

3. $\frac{\left(\frac{5}{2}\right)^{(-7)}}{\left(\frac{-2}{3}\right)^{(-7)}}$ =

(i) $\left(\frac{25}{8}\right)^{(-7)}$ (ii) $\left(\frac{13}{4}\right)^{(-7)}$ (iii) $\left(\frac{19}{6}\right)^{(-10)}$ (iv) $\left(\frac{19}{6}\right)^{(-7)}$ (v) $\left(\frac{19}{6}\right)^{(-5)}$

4. $\frac{\left(\frac{9}{7}\right)^{(-2/5)}}{\left(\frac{9}{7}\right)^{(3/2)}}$ =

(i) $\left(\frac{11}{7}\right)^{(-19/10)}$ (ii) $\left(\frac{9}{7}\right)^{(-17/8)}$ (iii) 1 (iv) $\left(\frac{9}{7}\right)^{(-7/4)}$ (v) $\left(\frac{9}{7}\right)^{(-19/10)}$

5. $[(-9)^{-3}]^{5} =$

(i) $(-9)^{-16}$ (ii) $(-12)^{-15}$ (iii) $(-9)^{-15}$ (iv) $(-9)^{-14}$ (v) $(-6)^{-15}$

6. $[(-9)^{-2}]^{4/3} =$

(i) $\left(\frac{-8}{3}\right)_{(-9)}$ (ii) $\left(\frac{-12}{5}\right)_{(-9)}$ (iii) $\left(\frac{-8}{3}\right)_{(-7)}$ (iv) $\left(\frac{-8}{3}\right)_{(-11)}$ (v) $(-9)^{-4}$

7. $[(-9)^{-4}]^{-4} =$

(i) $(-6)^{16}$ (ii) $(-12)^{16}$ (iii) $(-9)^{17}$ (iv) $(-9)^{16}$ (v) $(-9)^{15}$

8. $\left[\left(\frac{5}{2}\right)_{5}\right]^{5/4} =$

(i) $\left(\frac{19}{6}\right)_{5}$ (ii) $\left(\frac{25}{8}\right)_{2}$ (iii) $\left(\frac{25}{8}\right)_{7}$ (iv) $\left(\frac{25}{8}\right)_{5}$ (v) $\left(\frac{31}{10}\right)_{5}$

9. $\left[\left(\frac{9}{8}\right)^{2}\right]^{2} =$

(i) $\left(\frac{9}{8}\right)^{3}$ (ii) $\left(\frac{9}{8}\right)^{4}$ (iii) $\left(\frac{11}{8}\right)^{4}$ (iv) $\left(\frac{9}{8}\right)^{5}$ (v) $\left(\frac{7}{8}\right)^{4}$

10. $\left[\left(\frac{-8}{9}\right)^{3}\right]^{4/3} =$

(i) $\left(\frac{-8}{9}\right)^{4}$ (ii) $\left(\frac{-2}{3}\right)^{4}$ (iii) $\left(\frac{-10}{9}\right)^{4}$ (iv) $\left(\frac{-8}{9}\right)^{3}$ (v) $\left(\frac{-8}{9}\right)^{5}$

11. $\left[\left(\frac{5}{4}\right)^{(-3/2)}\right]^{4} =$

(i) $\left(\frac{5}{4}\right)^{-5}$ (ii) $\left(\frac{5}{4}\right)^{-7}$ (iii) $\left(\frac{3}{4}\right)^{-6}$ (iv) $\left(\frac{5}{4}\right)^{-6}$ (v) $\left(\frac{7}{4}\right)^{-6}$

12. $\left[\left(\frac{-9}{8}\right)^{(5/3)}\right]^{5}$ =

(i) $\left(\frac{-9}{8}\right)^{(41/5)}$ (ii) $\left(\frac{-7}{8}\right)^{(25/3)}$ (iii) $\left(\frac{-9}{8}\right)^{(25/3)}$ (iv) $\left(\frac{-11}{8}\right)^{(25/3)}$ (v) $\left(\frac{-9}{8}\right)^{9}$

13. Simplify the expression $3^{8} \times 3^{8} \times 3^{8}$

(i) 3^{23} (ii) 5^{24} (iii) 3^{24} (iv) 3^{25} (v) 1

14. Simplify the expression $5^{-5} \times 5^{-5}$

(i) 8^{-10} (ii) 5^{-9} (iii) 3^{-10} (iv) 5^{-11} (v) 5^{-10}

15. Simplify the expression $(-6)^{6} \times (-6)^{6}$

(i) $(-9)^{12}$ (ii) $(-4)^{12}$ (iii) $(-6)^{13}$ (iv) $(-6)^{12}$ (v) $(-6)^{11}$

16. Simplify the expression $(-2)^{-9} \times (-2)^{-9} \times (-2)^{-9}$

(i) $(-2)^{-28}$ (ii) 1 (iii) $(-2)^{-26}$ (iv) $(-5)^{-27}$ (v) $(-2)^{-27}$

17. Simplify $\frac{3^{2}}{(-5)^{2}}$

(i) $\left(\frac{1}{5}\right)^{2}$ (ii) 1 (iii) $\left(\frac{3}{5}\right)^{3}$ (iv) $\left(\frac{3}{5}\right)^{2}$ (v) $\frac{3}{5}$

18. Simplify $\frac{(-3)^{2} \times 4^{-2}}{3^{-2} \times (-3)^{2}}$

(i) $\left(\frac{3}{4}\right)^{3}$ (ii) $\left(\frac{5}{4}\right)^{2}$ (iii) $\left(\frac{1}{4}\right)^{2}$ (iv) $\left(\frac{3}{4}\right)^{2}$ (v) $\frac{3}{4}$

19. Simplify $\frac{5^{2} \times 5^{2} \times 2^{-2}}{3^{2} \times 2^{2} \times 4^{2}}$

(i) $\left(\frac{25}{48}\right)^{3}$ (ii) $\left(\frac{23}{48}\right)^{2}$ (iii) $\left(\frac{9}{16}\right)^{2}$ (iv) $\frac{25}{48}$ (v) $\left(\frac{25}{48}\right)^{2}$

20. Simplify $\frac{4^2\times(-4)^{-2}\times3^{-2}\times(-5)^2}{(-2)^2\times(-4)^2\times(-4)^2\times2^2}$

(i) $\left(\frac{1}{64}\right)^2$ (ii) $\frac{5}{192}$ (iii) $\left(\frac{5}{192}\right)^2$ (iv) $\left(\frac{7}{192}\right)^2$ (v) $\left(\frac{5}{192}\right)^3$

21. Simplify $\frac{(-4)^3\times5^3}{(-3)^3\times(-4)^2}$

(i) $\frac{2^2\times5^3}{5^3}$ (ii) $\frac{2^2\times5^3}{3}$ (iii) $\frac{2^2\times5^2}{3^3}$ (iv) $\frac{2^2\times5^3}{3^3}$ (v) $\frac{2^3\times5^3}{3^3}$

22. Simplify $\frac{(-3)^2\times4^3\times5^3}{5^2\times5^3\times2^3}$

(i) $\frac{2^3\times3^2}{7^2}$ (ii) $\frac{2^2\times3^2}{5^2}$ (iii) $\frac{2^3\times3^2}{3^2}$ (iv) $\frac{2^3\times3^3}{5^2}$ (v) $\frac{2^3\times3^2}{5^2}$

23. Simplify $\frac{3^3\times5^3\times2^2}{(-4)^2\times(-3)^2\times5^3\times(-2)^3}$

(i) $\frac{-1\times2^3\times3^3\times5^3}{2^7\times3^2\times5^3}$ (ii) $\frac{-1\times2^2\times3^3\times5^3}{2^7\times3^2\times5^3}$ (iii) $\frac{-1\times2^2\times3^2\times5^3}{2^7\times3^2\times5^3}$ (iv) $\frac{-1\times2^2\times3^3\times5^3}{2^7\times5^2\times5^3}$ (v) $\frac{-1\times2^2\times3^3\times5^3}{2^7\times0\times5^3}$

24. Simplify $\frac{(-4)^{-3}\times5^{-3}\times5^{-3}\times2^{-3}}{(-3)^{-3}\times2^{-2}\times(-4)^{-3}}$

(i) $\frac{(-1)^2\times2^8\times3^3}{2^9\times5^6}$ (ii) $\frac{-1\times2^7\times3^3}{2^9\times5^6}$ (iii) $\frac{-1\times2^8\times3^3}{2^9\times5^6}$ (iv) $\frac{-1\times2^8\times3^3}{2^9\times8^6}$ (v) $\frac{-1\times2^8\times3^3}{2^9\times2^6}$

25. Which of the following statements are true?

a) $(x^m)^n = x^{(m+n)}$

b) $(x^m)^n = (x^n)^m$

c) $a.x^m = a^m.x^m$

d) $a^m.a^n = a^{mn}$

e) $\frac{x^m}{x^n} = x^{\frac{m}{n}}$

f) $a^0 = 1 \ (a \neq 0)$

(i) {a,f,b} (ii) {d,e,b} (iii) {a,b} (iv) {b,f} (v) {c,f}

26. Find the reciprocal of 4^3

(i) $\left(\frac{1}{4}\right)^4$ (ii) $\left(\frac{3}{4}\right)^3$ (iii) $\left(\frac{-1}{4}\right)^3$ (iv) $\left(\frac{1}{4}\right)^3$ (v) $\left(\frac{1}{4}\right)^2$

27. Find the reciprocal of $\left(\frac{-6}{8}\right)^9$

(i) $\left(\frac{-8}{6}\right)^{10}$ (ii) $\left(\frac{-5}{3}\right)^9$ (iii) $\left(\frac{-8}{6}\right)^9$ (iv) $(-1)^9$ (v) $\left(\frac{-8}{6}\right)^8$

28. $\left(9^4 \times 3^2\right)^5 =$

(i) $9^{20} \times 3^2$ (ii) $9^{10} \times 3^{20}$ (iii) $9^4 \times 3^2$ (iv) $9^{20} \times 3^{10}$ (v) $9^4 \times 3^{10}$

29. $\frac{\left(5^3\right)^{-2} \times \left(7^{(-3)}\right)^{-3} \times \left(8^6\right)^5}{\left(5^{(-3)}\right)^4 \times \left(7^5\right)^6 \times \left(8^{(-5)}\right)^{-4}} =$

(i) $5^6 \times 7^{(-21)} \times 8^{10}$ (ii) $5^6 \times 7^{(-21)} \times 8^{11}$ (iii) $5^6 \times 7^{(-20)} \times 8^{10}$ (iv) $5^7 \times 7^{(-21)} \times 8^{10}$

30. $\left[\left(6^4\right)^4 \times \left(6^6\right)^5\right] \div 6^{46}$

(i) 2 (ii) 4 (iii) 1 (iv) 0 (v) 6

31. $\left[\left(\frac{7}{3}\right)^{-4} \times \left(\frac{2}{5}\right)^{-4}\right] \div \left[\left(\frac{3}{7}\right)^{4} \times \left(\frac{5}{2}\right)^{4}\right] =$

(i) $\frac{2}{5}$ (ii) $\frac{7}{3}$ (iii) 1 (iv) (-1) (v) 0

Assignment Key

1) (iv)	2) (i)	3) (iv)	4) (v)	5) (iii)	6) (i)
7) (iv)	8) (iv)	9) (ii)	10) (i)	11) (iv)	12) (iii)
13) (iii)	14) (v)	15) (iv)	16) (v)	17) (iv)	18) (iv)
19) (v)	20) (iii)	21) (iv)	22) (v)	23) (ii)	24) (iii)
25) (iv)	26) (iv)	27) (iii)	28) (iv)	29) (i)	30) (iii)
31) (iii)					