



1. Simplify the expression  $6^7 \times 6^7$

- (i)  $8^{14}$  (ii)  $3^{14}$  (iii)  $6^{13}$  (iv)  $6^{15}$  (v)  $6^{14}$

2. Simplify the expression  $3^{-9} \times 3^{-9}$

- (i)  $3^{-18}$  (ii)  $3^{-17}$  (iii)  $3^{-21}$  (iv)  $3^{-19}$  (v)  $5^{-18}$

3. Simplify the expression  $(-7)^6 \times (-7)^6 \times (-7)^6$

- (i)  $(-7)^{18}$  (ii)  $(-9)^{18}$  (iii)  $(-5)^{18}$  (iv)  $(-7)^{17}$  (v)  $(-7)^{19}$

4. Simplify the expression  $(-6)^{-3} \times (-6)^{-3}$

- (i)  $(-6)^{-5}$  (ii)  $(-8)^{-6}$  (iii)  $(-6)^{-7}$  (iv)  $(-6)^{-6}$  (v)  $(-3)^{-6}$

5. Simplify the expression  $5^{\left(\frac{9}{4}\right)} \times 5^{\left(\frac{9}{4}\right)}$

- (i)  $5^{\left(\frac{17}{4}\right)}$  (ii)  $8^{\left(\frac{9}{2}\right)}$  (iii)  $3^{\left(\frac{9}{2}\right)}$  (iv)  $5^5$  (v)  $5^{\left(\frac{9}{2}\right)}$

6. Simplify the expression  $6^{\left(\frac{-8}{5}\right)} \times 6^{\left(\frac{-8}{5}\right)} \times 6^{\left(\frac{-8}{5}\right)}$

- (i)  $6^{\left(\frac{-16}{3}\right)}$  (ii)  $6^{\left(\frac{-24}{5}\right)}$  (iii)  $3^{\left(\frac{-24}{5}\right)}$  (iv)  $9^{\left(\frac{-24}{5}\right)}$  (v)  $6^{\left(\frac{-32}{7}\right)}$

7. Simplify the expression  $(-3)^{\left(\frac{7}{6}\right)} \times (-3)^{\left(\frac{7}{6}\right)} \times (-3)^{\left(\frac{7}{6}\right)}$

- (i)  $(-3)^{\left(\frac{7}{2}\right)}$  (ii)  $(-3)^{\left(\frac{9}{2}\right)}$  (iii)  $(-5)^{\left(\frac{7}{2}\right)}$  (iv)  $(-3)^4$  (v)  $(-3)^{\left(\frac{13}{4}\right)}$

8. Simplify the expression  $\left(\frac{-3}{8}\right)_{(-4)}^2 \times \left(\frac{-3}{8}\right)_{(-4)}^2 \times \left(\frac{-3}{8}\right)_{(-4)}^2$

(i)  $\left(\frac{-9}{10}\right)_{(-4)}^2$  (ii)  $\left(\frac{-9}{8}\right)_{(-2)}^2$  (iii)  $\left(\frac{-9}{8}\right)_{(-4)}^2$  (iv)  $\left(\frac{-9}{8}\right)_{(-7)}^2$  (v)  $\left(\frac{-3}{2}\right)_{(-4)}^2$

9. Simplify the expression  $\left(\frac{9}{2}\right)_{(-4)}^2 \times \left(\frac{9}{2}\right)_{(-4)}^2$

(i)  $\left(\frac{9}{2}\right)_{(-4)}^5$  (ii)  $\left(\frac{7}{2}\right)_{(-4)}^4$  (iii)  $\left(\frac{9}{2}\right)_{(-4)}^4$  (iv)  $\left(\frac{9}{2}\right)_{(-4)}^3$  (v)  $\left(\frac{11}{2}\right)_{(-4)}^4$

10. Simplify the expression  $\left(\frac{8}{7}\right)_{(-4)}^{-4} \times \left(\frac{8}{7}\right)_{(-4)}^{-4}$

(i)  $\left(\frac{10}{7}\right)_{(-4)}^{-8}$  (ii)  $\left(\frac{8}{7}\right)_{(-4)}^{-9}$  (iii)  $\left(\frac{8}{7}\right)_{(-4)}^{-8}$  (iv)  $\left(\frac{6}{7}\right)_{(-4)}^{-8}$  (v)  $\left(\frac{8}{7}\right)_{(-4)}^{-7}$

11. Simplify the expression  $\left(\frac{-7}{2}\right)_{(-4)}^6 \times \left(\frac{-7}{2}\right)_{(-4)}^6$

(i)  $\left(\frac{-5}{2}\right)_{(-4)}^{12}$  (ii)  $\left(\frac{-7}{2}\right)_{(-4)}^{13}$  (iii)  $\left(\frac{-7}{2}\right)_{(-4)}^{11}$  (iv)  $\left(\frac{-7}{2}\right)_{(-4)}^{12}$  (v)  $\left(\frac{-9}{2}\right)_{(-4)}^{12}$

12. Simplify the expression  $\left(\frac{-2}{3}\right)_{(-4)}^{-6} \times \left(\frac{-2}{3}\right)_{(-4)}^{-6}$

(i)  $\left(\frac{-2}{3}\right)_{(-4)}^{-12}$  (ii)  $\left(\frac{-4}{3}\right)_{(-4)}^{-12}$  (iii)  $\left(\frac{-2}{3}\right)_{(-4)}^{-10}$  (iv)  $\left(\frac{-2}{3}\right)_{(-4)}^{-13}$  (v)  $\left(\frac{-2}{3}\right)_{(-4)}^{-11}$

13. Simplify the expression  $\left(\frac{4}{3}\right)^{(8/7)} \times \left(\frac{4}{3}\right)^{(8/7)}$

- (i)  $\left(\frac{4}{3}\right)^{(12/5)}$  (ii)  $\left(\frac{2}{3}\right)^{(16/7)}$  (iii)  $\left(\frac{4}{3}\right)^{(20/9)}$  (iv)  $\left(\frac{4}{3}\right)^{(16/7)}$  (v)  $2^{\left(\frac{16}{7}\right)}$

14. Simplify the expression  $\left(\frac{7}{3}\right)^{(-8/3)} \times \left(\frac{7}{3}\right)^{(-8/3)}$

- (i)  $\left(\frac{7}{3}\right)^{(-26/5)}$  (ii)  $\left(\frac{7}{3}\right)^{-6}$  (iii)  $\left(\frac{5}{3}\right)^{(-16/3)}$  (iv)  $3^{\left(\frac{-16}{3}\right)}$  (v)  $\left(\frac{7}{3}\right)^{(-16/3)}$

15. Simplify the expression  $\left(\frac{-9}{5}\right)^{(7/6)} \times \left(\frac{-9}{5}\right)^{(7/6)}$

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

16. Simplify the expression  $\left(\frac{-3}{8}\right)^{(-5/4)} \times \left(\frac{-3}{8}\right)^{(-5/4)}$

- (i)  $\left(\frac{-3}{8}\right)^{(-9/4)}$  (ii)  $\left(\frac{-3}{8}\right)^{-3}$  (iii)  $\left(\frac{-1}{8}\right)^{(-5/2)}$  (iv)  $\left(\frac{-3}{8}\right)^{(-5/2)}$  (v)  $\left(\frac{-5}{8}\right)^{(-5/2)}$

17. Simplify the expression  $8^{\left(\frac{9}{5}\right)} \times 8^{\left(\frac{9}{8}\right)}$

- (i)  $11^{\left(\frac{117}{40}\right)}$  (ii)  $8^{\left(\frac{113}{38}\right)}$  (iii)  $5^{\left(\frac{117}{40}\right)}$  (iv)  $8^{\left(\frac{121}{42}\right)}$  (v)  $8^{\left(\frac{117}{40}\right)}$

18. Simplify the expression  $9^{-4} \times 9^{-2}$

- (i)  $11^{-6}$  (ii)  $9^{-6}$  (iii)  $6^{-6}$  (iv)  $9^{-7}$  (v)  $9^{-5}$

19. Simplify the expression  $\left(\frac{8}{3}\right)_{(-5)} \times \left(\frac{3}{2}\right)_{(-5)}$

- (i)  $\left(\frac{25}{6}\right)_{(-2)}$  (ii)  $\left(\frac{33}{8}\right)_{(-5)}$  (iii)  $\left(\frac{17}{4}\right)_{(-5)}$  (iv)  $\left(\frac{25}{6}\right)_{(-7)}$  (v)  $\left(\frac{25}{6}\right)_{(-5)}$

20. Simplify the expression  $\left(\frac{-5}{6}\right)_{(-9)} \times \left(\frac{-9}{4}\right)_{(-9)}$

- (i)  $\left(\frac{-37}{12}\right)_{(-12)}$  (ii)  $\left(\frac{-37}{12}\right)_{(-9)}$  (iii)  $\left(\frac{-43}{14}\right)_{(-9)}$  (iv)  $\left(\frac{-31}{10}\right)_{(-9)}$  (v)  $\left(\frac{-37}{12}\right)_{(-7)}$

21. Simplify the expression  $\left(\frac{9}{2}\right)^7 \times \left(\frac{9}{2}\right)^5 \times \left(\frac{9}{2}\right)^6$

- (i)  $\left(\frac{9}{2}\right)^{19}$  (ii)  $\left(\frac{9}{2}\right)^{18}$  (iii)  $\left(\frac{9}{2}\right)^{17}$  (iv)  $\left(\frac{7}{2}\right)^{18}$  (v)  $\left(\frac{11}{2}\right)^{18}$

22. Simplify the expression  $\left(\frac{8}{7}\right)^{-5} \times \left(\frac{8}{7}\right)^{-5} \times \left(\frac{8}{7}\right)^{-3}$

- (i)  $\left(\frac{8}{7}\right)^{-13}$  (ii)  $\left(\frac{8}{7}\right)^{-14}$  (iii)  $\left(\frac{6}{7}\right)^{-13}$  (iv)  $\left(\frac{10}{7}\right)^{-13}$  (v)  $\left(\frac{8}{7}\right)^{-12}$

23. Simplify the expression  $\left(\frac{-9}{5}\right)^6 \times \left(\frac{-9}{5}\right)^5$

- (i)  $\left(\frac{-11}{5}\right)^{11}$  (ii)  $\left(\frac{-9}{5}\right)^{10}$  (iii)  $\left(\frac{-9}{5}\right)^{12}$  (iv)  $\left(\frac{-7}{5}\right)^{11}$  (v)  $\left(\frac{-9}{5}\right)^{11}$

24. Simplify the expression  $(-3)^{-4} \times (-3)^{-3}$

- (i)  $(-3)^{-8}$  (ii)  $(-3)^{-6}$  (iii)  $(-5)^{-7}$  (iv)  $(-1)^{-7}$  (v)  $(-3)^{-7}$

25. Simplify the expression  $\left(\frac{5}{3}\right)^{(7/2)} \times \left(\frac{5}{3}\right)^{(7/2)} \times \left(\frac{5}{3}\right)^{(9/7)}$

- (i)  $\left(\frac{7}{3}\right)^{(58/7)}$  (ii)  $\left(\frac{5}{3}\right)^{(42/5)}$  (iii)  $\left(\frac{5}{3}\right)^{(74/9)}$  (iv) 1 (v)  $\left(\frac{5}{3}\right)^{(58/7)}$

26. Simplify the expression  $6^{\left(\frac{-5}{7}\right)} \times 6^{\left(\frac{-4}{3}\right)} \times 6^{\left(\frac{-2}{3}\right)}$

- (i)  $6^{\left(\frac{-19}{7}\right)}$  (ii)  $6^{-3}$  (iii)  $9^{\left(\frac{-19}{7}\right)}$  (iv)  $3^{\left(\frac{-19}{7}\right)}$  (v)  $6^{\left(\frac{-23}{9}\right)}$

27. Simplify the expression  $\left(\frac{-9}{5}\right)^{(7/3)} \times \left(\frac{-9}{5}\right)^{(7/5)} \times \left(\frac{-9}{5}\right)^{(6/5)}$

- (i)  $\left(\frac{-9}{5}\right)^{(82/17)}$  (ii)  $\left(\frac{-7}{5}\right)^{(74/15)}$  (iii)  $\left(\frac{-9}{5}\right)^{(74/15)}$  (iv)  $\left(\frac{-9}{5}\right)^{(66/13)}$  (v)  $\left(\frac{-11}{5}\right)^{(74/15)}$

28. Simplify the expression  $\left(\frac{-7}{6}\right)^{(-4/5)} \times \left(\frac{-7}{6}\right)^{-5}$

- (i)  $\left(\frac{-5}{6}\right)^{(-29/5)}$  (ii)  $\left(\frac{-7}{6}\right)^{(-19/3)}$  (iii)  $\left(\frac{-7}{6}\right)^{(-29/5)}$  (iv)  $\left(\frac{-3}{2}\right)^{(-29/5)}$  (v)  $\left(\frac{-7}{6}\right)^{(-39/7)}$

29. Simplify the expression  $5^5 \times 2^5$

- (i)  $10^4$  (ii)  $10^5$  (iii)  $7^5$  (iv)  $10^6$  (v)  $12^5$

30. Simplify the expression  $3^{-8} \times 6^{-8}$

- (i)  $18^{-7}$  (ii)  $15^{-8}$  (iii)  $20^{-8}$  (iv)  $18^{-8}$  (v)  $18^{-9}$

31. Simplify the expression  $(-2)^2 \times (-5)^2 \times (-3)^2$

- (i)  $(-28)^2$  (ii)  $(-30)^3$  (iii)  $(-32)^2$  (iv)  $(-30)^2$  (v) -30

32. Simplify the expression  $(-4)^{-8} \times (-9)^{-8}$

- (i)  $36^{-7}$  (ii)  $36^{-9}$  (iii)  $34^{-8}$  (iv)  $38^{-8}$  (v)  $36^{-8}$

33. Simplify the expression  $3^{\left(\frac{5}{2}\right)} \times 5^{\left(\frac{5}{2}\right)}$

- (i)  $15^{\left(\frac{5}{2}\right)}$  (ii)  $15^{\left(\frac{5}{4}\right)}$  (iii)  $15^5$  (iv)  $13^{\left(\frac{5}{2}\right)}$  (v)  $17^{\left(\frac{5}{2}\right)}$

34. Simplify the expression  $5^{\left(\frac{-9}{8}\right)} \times 7^{\left(\frac{-9}{8}\right)}$

- (i)  $35^{\left(\frac{-3}{2}\right)}$  (ii)  $32^{\left(\frac{-9}{8}\right)}$  (iii)  $35^{\left(\frac{-9}{8}\right)}$  (iv)  $35^{\left(\frac{-9}{10}\right)}$  (v)  $38^{\left(\frac{-9}{8}\right)}$

35. Simplify the expression  $(-3)^{\left(\frac{7}{5}\right)} \times (-9)^{\left(\frac{7}{5}\right)} \times (-6)^{\left(\frac{7}{5}\right)}$

- (i)  $(-165)^{\left(\frac{7}{5}\right)}$  (ii)  $(-162)^{\left(\frac{7}{3}\right)}$  (iii)  $(-160)^{\left(\frac{7}{5}\right)}$  (iv)  $(-162)^{\left(\frac{7}{5}\right)}$  (v)  $-162$

36. Simplify the expression  $(-6)^{\left(\frac{-7}{9}\right)} \times (-5)^{\left(\frac{-7}{9}\right)} \times (-2)^{\left(\frac{-7}{9}\right)}$

- (i)  $(-57)^{\left(\frac{-7}{9}\right)}$  (ii)  $(-60)^{-1}$  (iii)  $(-60)^{\left(\frac{-7}{11}\right)}$  (iv)  $(-62)^{\left(\frac{-7}{9}\right)}$  (v)  $(-60)^{\left(\frac{-7}{9}\right)}$

37. Simplify the expression  $\left(\frac{7}{4}\right)^2 \times \left(\frac{5}{4}\right)^2$

- (i)  $\left(\frac{33}{16}\right)^2$  (ii)  $\left(\frac{37}{16}\right)^2$  (iii)  $2\frac{3}{16}$  (iv)  $\left(\frac{35}{16}\right)^3$  (v)  $\left(\frac{35}{16}\right)^2$

38. Simplify the expression  $5^{-7} \times \left(\frac{9}{7}\right)^{-7} \times 7^{-7}$

- (i)  $45^{-7}$  (ii)  $43^{-7}$  (iii)  $45^{-8}$  (iv)  $45^{-6}$  (v)  $47^{-7}$

39. Simplify the expression  $\left(\frac{-5}{3}\right)^8 \times \left(\frac{-6}{5}\right)^8 \times \left(\frac{-8}{5}\right)^8$

(i)  $\left(\frac{-16}{5}\right)^8$  (ii)  $\left(\frac{-18}{5}\right)^8$  (iii)  $\left(\frac{-16}{5}\right)^9$  (iv)  $\left(\frac{-14}{5}\right)^8$  (v)  $\left(\frac{-16}{5}\right)^7$

40. Simplify the expression  $\left(\frac{-5}{2}\right)^{-9} \times \left(\frac{-2}{3}\right)^{-9} \times \left(\frac{-5}{6}\right)^{-9}$

(i)  $\left(\frac{-3}{2}\right)^{-9}$  (ii)  $\left(\frac{-25}{18}\right)^{-8}$  (iii)  $\left(\frac{-25}{18}\right)^{-9}$  (iv)  $\left(\frac{-23}{18}\right)^{-9}$  (v)  $\left(\frac{-25}{18}\right)^{-10}$

41. Simplify the expression  $\left(\frac{8}{5}\right)^9 \times \left(\frac{5}{2}\right)^9$

(i)  $4^9$  (ii)  $6^9$  (iii)  $1$  (iv)  $4^8$  (v)  $4^{10}$

42. Simplify the expression  $\left(\frac{7}{6}\right)^{-3} \times \left(\frac{9}{7}\right)^{-3}$

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

43. Simplify the expression  $\left(\frac{7}{4}\right)^{-4} \times \left(\frac{7}{8}\right)^{-4}$

(i)  $\left(\frac{-1}{2}\right)^{(7/4)}$  (ii)  $\left(\frac{1}{2}\right)^{(7/4)}$  (iii)  $\left(\frac{3}{2}\right)^{(7/4)}$  (iv)  $\left(\frac{1}{2}\right)^{(7/2)}$  (v)  $\left(\frac{1}{2}\right)^{(7/6)}$

44. Simplify the expression  $\left(\frac{-2}{9}\right)^{(-7/5)} \times \left(\frac{-7}{5}\right)^{(-7)} \times \left(\frac{-7}{2}\right)^{(-7/5)}$

- (i)  $\left(\frac{-49}{9}\right)^{(-7/5)}$  (ii)  $\left(\frac{-17}{3}\right)^{(-7/5)}$  (iii)  $\left(\frac{-49}{9}\right)^{-1}$  (iv)  $\left(\frac{-47}{9}\right)^{(-7/5)}$  (v)  $\left(\frac{-49}{9}\right)^{(-7/3)}$

45. Simplify  $\frac{2^{-2}}{4^2}$

- (i)  $5^{-6}$  (ii)  $2^{-6}$  (iii)  $(-1)^{-6}$  (iv)  $2^{-7}$  (v)  $2^{-5}$

46. Simplify  $\frac{(-4)^2 \times 2^{-2}}{(-4)^{-2} \times 5^2}$

- (i)  $\left(\frac{8}{5}\right)^2$  (ii)  $\left(\frac{6}{5}\right)^2$  (iii)  $\left(\frac{8}{5}\right)^3$  (iv)  $2^2$  (v)  $\frac{8}{5}$

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

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

48. Simplify  $\frac{2^2 \times (-5)^{-2} \times 2^{-2} \times 5^{-2}}{5^2 \times (-4)^{-2} \times (-4)^2 \times 5^2}$

- (i)  $5^{-7}$  (ii)  $5^{-8}$  (iii)  $2^{-8}$  (iv)  $5^{-9}$  (v)  $8^{-8}$

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

- (i)  $(-1)^2 \times 3^2 \times 5$  (ii)  $2^3 \times 3^2 \times 5$  (iii)  $5^2 \times 3^2 \times 5$  (iv)  $2 \times 3^2 \times 5$  (v)  $2^2 \times 3^2 \times 5$

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

- (i)  $\frac{-1 \times 2^3}{1 \times 5^8}$  (ii)  $\frac{(-1)^2 \times 2^3}{3^5 \times 5^8}$  (iii)  $\frac{-1 \times 2^3}{3^5 \times 7^8}$  (iv)  $\frac{-1 \times 2^3}{3^5 \times 5^8}$  (v)  $\frac{-2 \times 2^3}{3^5 \times 5^8}$

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

- (i)  $\frac{3^3}{(-1)^8}$  (ii)  $\frac{3^4}{2^8}$  (iii)  $\frac{3^2}{2^8}$  (iv)  $\frac{3^3}{4^8}$  (v)  $\frac{3^3}{2^8}$

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

- (i)  $\frac{-1 \times 3^2}{2^7}$  (ii)  $\frac{-1 \times 3^2}{4^9}$  (iii)  $\frac{-1 \times 3^3}{2^9}$  (iv)  $\frac{-2 \times 3^2}{2^9}$  (v)  $\frac{-1 \times 3^2}{2^9}$

53. Simplify the expression  $5^3 \times 5^3 \times 5^3$

- (i)  $5^9$  (ii)  $5^8$  (iii)  $8^9$  (iv)  $5^{10}$  (v)  $2^9$

54. Simplify the expression  $7^{-6} \times 7^{-6} \times 7^{-6}$

- (i)  $7^{-18}$  (ii)  $7^{-17}$  (iii)  $7^{-19}$  (iv)  $9^{-18}$  (v)  $4^{-18}$

55. Simplify the expression  $(-4)^5 \times (-4)^5$

- (i)  $(-4)^{11}$  (ii)  $(-1)^{10}$  (iii)  $(-4)^9$  (iv)  $(-4)^{10}$  (v)  $(-6)^{10}$

56. Simplify the expression  $(-6)^{-8} \times (-6)^{-8}$

- (i)  $(-3)^{-16}$  (ii)  $(-6)^{-15}$  (iii)  $(-9)^{-16}$  (iv)  $(-6)^{-17}$  (v)  $(-6)^{-16}$

## Assignment Key

1) (v)	2) (i)	3) (i)	4) (iv)	5) (v)	6) (ii)
7) (i)	8) (iii)	9) (iii)	10) (iii)	11) (iv)	12) (i)
13) (iv)	14) (v)	15) (ii)	16) (iv)	17) (v)	18) (ii)
19) (v)	20) (ii)	21) (ii)	22) (i)	23) (v)	24) (v)
25) (v)	26) (i)	27) (iii)	28) (iii)	29) (ii)	30) (iv)
31) (iv)	32) (v)	33) (i)	34) (iii)	35) (iv)	36) (v)
37) (v)	38) (i)	39) (i)	40) (iii)	41) (i)	42) (i)
43) (ii)	44) (i)	45) (ii)	46) (i)	47) (iv)	48) (ii)
49) (v)	50) (iv)	51) (v)	52) (v)	53) (i)	54) (i)
55) (iv)	56) (v)				