



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

(i)  $6^{\left(\frac{-5}{2}\right)}$  (ii)  $3^{\left(\frac{-9}{4}\right)}$  (iii)  $3^{-3}$  (iv)  $3^{\left(\frac{-7}{2}\right)}$  (v)  $3^{\left(\frac{-5}{2}\right)}$

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

(i)  $(-6)^8$  (ii)  $(-6)^9$  (iii)  $(-6)^7$  (iv)  $(-3)^8$  (v)  $(-9)^8$

3. Simplify the expression  $\left(\frac{9}{8}\right)^{\left(\frac{-4}{9}\right)} \times \left(\frac{9}{8}\right)^{\left(\frac{-4}{9}\right)}$

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

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

(i)  $\left(\frac{-7}{5}\right)^{\left(\frac{-10}{7}\right)}$  (ii)  $\left(\frac{-7}{5}\right)^{\left(\frac{-10}{9}\right)}$  (iii)  $\left(\frac{-7}{5}\right)^{-2}$  (iv)  $\left(\frac{-10}{7}\right)^{\left(\frac{-10}{7}\right)}$  (v)  $\left(\frac{-9}{5}\right)^{\left(\frac{-10}{7}\right)}$

5. Simplify the expression  $(-7)^{-6} \times (-7)^{-4}$

(i)  $(-10)^{-10}$  (ii)  $(-5)^{-10}$  (iii)  $(-7)^{-9}$  (iv)  $(-7)^{-11}$  (v)  $(-7)^{-10}$

6. Simplify the expression  $5^{\left(\frac{7}{4}\right)} \times 5^{\left(\frac{3}{2}\right)} \times 5^{\left(\frac{9}{5}\right)}$

(i)  $5^{\left(\frac{111}{22}\right)}$  (ii)  $5^{\left(\frac{91}{18}\right)}$  (iii)  $2^{\left(\frac{101}{20}\right)}$  (iv)  $5^{\left(\frac{101}{20}\right)}$  (v)  $7^{\left(\frac{101}{20}\right)}$

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

(i)  $7^{\left(\frac{41}{5}\right)}$  (ii)  $9^{\left(\frac{57}{7}\right)}$  (iii)  $12^{\left(\frac{41}{5}\right)}$  (iv)  $9^{\left(\frac{25}{3}\right)}$  (v)  $9^{\left(\frac{41}{5}\right)}$

8. Simplify the expression  $3^{-3} \times 2^{-3} \times 6^{-3}$

(i)  $36^{-4}$  (ii)  $36^{-3}$  (iii)  $36^{-2}$  (iv)  $39^{-3}$  (v)  $33^{-3}$

9. Simplify the expression  $(-5)^{-5} \times \left(\frac{-3}{2}\right)^{-5} \times \left(\frac{-8}{9}\right)^{-5}$

(i)  $\left(\frac{-20}{3}\right)^{-5}$  (ii)  $\left(\frac{-20}{3}\right)^{-6}$  (iii)  $\left(\frac{-22}{3}\right)^{-5}$  (iv)  $(-6)^{-5}$  (v)  $\left(\frac{-20}{3}\right)^{-4}$

10. Simplify the expression  $\left(\frac{7}{3}\right)^{\left(\frac{7}{4}\right)} \times \left(\frac{8}{5}\right)^{\left(\frac{7}{4}\right)}$

(i)  $\left(\frac{58}{15}\right)^{\left(\frac{7}{4}\right)}$  (ii)  $\left(\frac{56}{15}\right)^{\left(\frac{7}{6}\right)}$  (iii)  $\left(\frac{18}{5}\right)^{\left(\frac{7}{4}\right)}$  (iv)  $\left(\frac{56}{15}\right)^{\left(\frac{7}{4}\right)}$  (v)  $\left(\frac{56}{15}\right)^{\left(\frac{7}{2}\right)}$

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

(i)  $\left(\frac{72}{35}\right)^{\left(\frac{-8}{9}\right)}$  (ii)  $2^{\left(\frac{-8}{7}\right)}$  (iii)  $\left(\frac{72}{35}\right)^{\left(\frac{-8}{7}\right)}$  (iv)  $\left(\frac{72}{35}\right)^{\left(\frac{-8}{5}\right)}$  (v)  $\left(\frac{74}{35}\right)^{\left(\frac{-8}{7}\right)}$

12. Simplify the expression  $\left(\frac{-5}{7}\right)^{\left(\frac{-3}{4}\right)} \times \left(\frac{-5}{9}\right)^{\left(\frac{-3}{4}\right)}$

(i)  $\left(\frac{25}{63}\right)^{\left(\frac{-3}{2}\right)}$  (ii)  $\left(\frac{25}{63}\right)^{\left(\frac{-1}{2}\right)}$  (iii)  $\left(\frac{3}{7}\right)^{\left(\frac{-3}{4}\right)}$  (iv)  $\left(\frac{23}{63}\right)^{\left(\frac{-3}{4}\right)}$  (v)  $\left(\frac{25}{63}\right)^{\left(\frac{-3}{4}\right)}$

13. Simplify  $\frac{5^2}{2^2}$

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

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

(i)  $\left(\frac{4}{5}\right)^3$  (ii)  $\left(\frac{2}{5}\right)^2$  (iii)  $\left(\frac{4}{5}\right)^2$  (iv)  $\left(\frac{6}{5}\right)^2$  (v)  $\frac{4}{5}$

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

(i)  $\left(\frac{5}{18}\right)^3$  (ii)  $\frac{5}{18}^2$  (iii)  $\left(\frac{5}{18}\right)^2$  (iv)  $\left(\frac{1}{6}\right)^2$  (v)  $\left(\frac{7}{18}\right)^2$

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

(i) 2 (ii) 1 (iii) 0 (iv) -1 (v) 3

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

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

18. Simplify  $\frac{3^2 \times 5^3 \times 3^3}{4^{-2} \times (-4)^{-3} \times (-3)^{-2}}$

(i)  $-1 \times 2^{10} \times 3^7 \times 5^3$  (ii)  $-1 \times 2^{10} \times 3^6 \times 5^3$  (iii)  $-1 \times 2^{10} \times 5^7 \times 5^3$  (iv)  $-1 \times 2^{11} \times 3^7 \times 5^3$   
(v)  $-1 \times 2^{10} \times 3^7 \times 3^3$

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

(i)  $\frac{2^8 \times 3^2}{2^2 \times 3^5 \times 3^3}$  (ii)  $\frac{2^9 \times 3^2}{2^2 \times 3^5 \times 5^3}$  (iii)  $\frac{2^7 \times 3^2}{2^2 \times 3^5 \times 5^3}$  (iv)  $\frac{2^8 \times 3^2}{2^2 \times 3^5 \times 5^3}$  (v)  $\frac{2^8 \times 3^2}{2^2 \times 5^5 \times 5^3}$

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

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

21.  $(2^4 \times 3^5)^6 =$

- (i)  $2^{24} \times 3^5$  (ii)  $2^4 \times 3^{30}$  (iii)  $2^4 \times 3^5$  (iv)  $2^{24} \times 3^{30}$  (v)  $2^{30} \times 3^{24}$

22.  $\frac{(4^{(-6)})^3 \times (7^5)^5 \times (9^{(-6)})^4}{(4^2)^5 \times (7^{(-6)})^{-5} \times (9^{(-5)})^{-6}} =$

- (i)  $4^{(-28)} \times 7^{(-5)} \times 9^{(-53)}$  (ii)  $4^{(-28)} \times 7^{(-5)} \times 9^{(-54)}$  (iii)  $4^{(-27)} \times 7^{(-5)} \times 9^{(-54)}$  (iv)  $4^{(-28)} \times 7^{(-4)} \times 9^{(-54)}$

## Assignment Key

|           |           |           |          |           |         |
|-----------|-----------|-----------|----------|-----------|---------|
| 1) (v)    | 2) (i)    | 3) (i)    | 4) (i)   | 5) (v)    | 6) (iv) |
| 7) (v)    | 8) (ii)   | 9) (i)    | 10) (iv) | 11) (iii) | 12) (v) |
| 13) (iii) | 14) (iii) | 15) (iii) | 16) (ii) | 17) (iii) | 18) (i) |
| 19) (iv)  | 20) (iv)  | 21) (iv)  | 22) (ii) |           |         |