Indices
Practice Questions

Evaluate the following expressions (without your calculator).

1. $10^6 \div 10^4$

2. $2^8 \div 2$

3. 4^0

4. 10^0

5. 3×5^0

6. 10^{-3}

7. 8^{-1}

8. 3^{-3}

9. $49^{1/2}$

10. $8^{2/3}$

11. $25^{3/2}$

12. $32^{3/5}$

13. $\left(2^3\right)^2$

14. $\left(3^4\right)^{1/4}$

Simplify the following expressions.

15. $m^5 \times m^3$

16. $x \times x^2$

17. $x^4 \times x^2$

18. $y^2 \times y^b$

19. $a^m \times a^n$

20. $x^9 \div x^2$

21. $t^4 \div t^2$

22. $x^7 \div x^{-2}$

23. x^0

24. $(ax)^0$

25. $a \times b^0$

26. $x + y^0$

27. $\left(x^3\right)^4$

28. $\left(a^2b^4\right)^4$

29. $\left(p^{-1}q^5\right)^{-1}$

30. $\left(a^{1/2}\right)^3$

Rewrite the following expressions using only positive indices.

31. $\left(\frac{1}{x}\right)^{-1}$

32. y^{-3}

Simplify the following expressions.

33. $2^n \times 2^{2n} \times 2^{3n}$

34. $a^3 \times a^5 \times a^{-2}$

35. $x^2 \times x^4 \times x^3$

36. $\left(p^2q\right)^4 \times \left(q^2p\right)^5$

37. $a^3b^{-2} \times \left(a^2b^2\right)^4$

Rewrite the following expressions using only positive indices.

38. $\left(a^2\right)^0 \times \left(a^{1/2}\right)^4$

39. $\dfrac{(2x)^{-3}}{x^3}$

40. $\dfrac{2a^2b^{-2}}{2^{-3}b^{-4}}$

41. $\dfrac{x^{-1} + y^{-1}}{x + y}$

42. $\dfrac{10^n - 4^n}{5^n - 2^n}$

Simplify the following expressions.

43. $\dfrac{\left(2m^2n\right)^3}{\left(mn^3\right)^2 \times \left(4m^2\right)^2}$

44. $\dfrac{5x^5y^2 \times 3\left(xy^3\right)^2}{15x^2y}$

Find the values of x that make the following equations hold.

45. $3^x = 81$

46. $2^x = 8$

47. $x^{-2} = 9$

48. $x^3 = -125$

49. $4^x = 32$

50. $9 \times 3^{x-1} = \dfrac{1}{27}$