

Indices Past Paper Questions

1. Simplify $w^4 \times w^5 = w^9$
2. Simplify $\frac{12a^7b^4}{4ab^3} = 3a^6b$
3. Simplify $\frac{24x^{12}y^6}{8x^4y^8} = 3x^8y^{-2}$
4. Simplify $(2x^3y^2)^4 = 16x^{12}y^8$
5. Simplify $3y^{1/2} \times 4y^{3/2} = 12y^{4/2} = 12y^2$
6. Simplify $\frac{6x^{\frac{1}{2}}}{3x^{-\frac{1}{2}}} = 2x^{\frac{1}{2} - (-\frac{1}{2})} = 2x^{\frac{1}{2} + \frac{1}{2}} = 2x$
7. Express $9^{-1/2}$ as a fraction $= \frac{1}{9^{1/2}} = \frac{1}{\sqrt{9}} = \frac{1}{3}$
8. Simplify $2a^5b^2 \times 3a^3b = 6a^8b^3$
9. Simplify $(3x^5y^2)^3 = 27x^{15}y^6$
10. Simplify $\frac{24 \times a^{\frac{5}{2}} \times a^{-\frac{1}{2}}}{8 \times a^4} = 3a^{\frac{5}{2} + (-\frac{1}{2}) - 4} = 3a^{\frac{5}{2} - \frac{1}{2} - 4} = 3a^{\frac{4}{2} - 4} = 3a^{2-4} = 3a^{-2} = \frac{3}{a^2}$
11. Simplify $(5x^3)^2 = 25x^6$
12. Simplify $(4x^3y^2) \times (2x^4y^5) = 8x^7y^7$
13. Find, in its simplest form, the reciprocal of $3x^{-2} = (3x^{-2})^{-1} = 3^{-1}x^2 = \frac{1}{3}x^2$
14. Simplify each of the following *what, times itself 4 times gives 16*
 - a. $16^{3/4} = (\sqrt[4]{16})^3 = 2^3 = 8$
 - b. $9^{-1/2} = (\frac{1}{9^{1/2}}) = \frac{1}{\sqrt{9}} = \frac{1}{3}$
15. Given that $0 < x < 1$, write x , $1/x$ and x^2 in ascending order. *I'll go through in class*
16. Simplify $4c^7d^3 \times 3c^4d = 12c^{11}d^4$
17. Simplify $(4x^5y^2)^3 = 64x^{15}y^6$
18. Simplify $\frac{18 \times a^{\frac{5}{2}} \times a^{-\frac{3}{2}}}{6a^2} = 3a^{\frac{5}{2} + (-\frac{3}{2}) - 2} = 3a^{\frac{5}{2} - \frac{3}{2} - 2} = 3a^{\frac{2}{2} - 2} = 3a^{1-2} = 3a^{-1} = \frac{3}{a}$
19. Evaluate $25^{0.5} \times 10^{-2} = 25^{\frac{1}{2}} \times \frac{1}{10^2} = \sqrt{25} \times \frac{1}{100} = \frac{5}{100} = \frac{1}{20}$
20. Simplify $(\sqrt{8})^2 = (8^{\frac{1}{2}})^2 = 8$
21. Evaluate $2^{-2} = \frac{1}{2^2} = \frac{1}{4}$
22. Evaluate $7^0 = 1$

23. Write down a value of x for which $x^{3/2}$ is rational. *Any square number*
eg $x=4$ $(\sqrt{4})^3 = 2^3 = 8$
 $x=9$ $(\sqrt{9})^3 = 3^3 = 27$ etc