EXPONENTS

Laws of Exponents

1. $x^m \cdot x^n = x^{m+n}$ 2. $\left(x^m\right)^n = x^{m \cdot n}$

3. $\frac{x^m}{x^n} = x^{m-n}$ if $m > n$ and $\frac{x^m}{x^n} = \frac{1}{x^{n-m}}$ if $n > m$

Write in simplified exponential form

1. $x^2\ x^3\ x^{-4} = x$

2. $x^{y+2}\ x^{2y-5} = x^{3y-3}$

3. $x^{7y-3}\ x^{-4y+2} = x^{3y-1}$

4. $x^{3i+2}\ x^{6i-1} = x^{9i+1}$

5. $8^{3x}\ 4^{5x} = 2^{19x}$

6. $81^{2x-1}\ 15^{x+3} = 3^{9x-1}5^{+3}$

7. $x^{\sqrt{3}}\ x^{\sqrt{9}} = x^{3+\sqrt{3}}$

8. $x^{2\sqrt{6y}}\ x^{3\sqrt{6y}} = x^{5\sqrt{6y}}$

9. $(x^2)^4 = x^8$

10. $(2x^6)^3 = 2^3x^8$

11. $(x^3)^{2y+1} = x^{6y+3}$

12. $(x^{y-5})^{3y+1} = x^{3y^2-14x-5}$

13. $(x^{2i-6})^{5i} = x^{-10-30i}$

14. $(4^{3xi-2})^{4i+2} = 2^{-24x+12xi-16i-8}$

15. $(x^{\sqrt{5}})^{\sqrt{3}} = x^{\sqrt{15}}$

16. $(x^3y^5)^{\sqrt{6}} = x^{3\sqrt{6}}y^{5\sqrt{6}}$

17.

18. $x^{2/3}\ x^{5/3}\ x^{7/3} = x^{14/3}$

19. $x^{3/4}\ x^{5/3} = x^{29/12}$

20. $x^2\ y^{5/7}\ x^{4/3}\ y^{1/2} = x^{10/3}y^{17/14}$

21. $(x^{2/5})^{2/3} = x^{4/15}$

22. $(5x^{5/2})^{3/4} = 5^{3/4}x^{15/8}$

23. $(x^{2/3})^{3/4}\ (x^{3/2})^{1/4} = x^{7/8}$

24. $\frac{x^5}{x^7} = \frac{1}{x^2}$

25. $\frac{x^{4y+2}}{x^{3y-1}} = x^{y+3}$

26. $\frac{x^{4i-3}}{x^{2i+1}} = x^{2i-4}$

27. $\frac{x^{y+7}}{x^{6y+2}} = x^{-5y+5}$

28. $\frac{6x^{3y}}{3x^{y+1}} = 2x^{2y-1}$

29. $(3x)^3(4x)^5 = 3^3 2^{10}x^8$

30. $(x^4y^2)^3\ (x^{-2}y^2)^5 = x^2y^{16}$

31. $\frac{(x^3y^2)^2(x^2y^4)^3}{(x^3y^4)^2} = x^6y^8$

32. $\frac{(x^{2/3}y^{1/4})^2}{(x^{3/4}y^{1/3})^3} = \frac{1}{x^{\frac{11}{12}}y^{\frac{6}{12}}}$

33. $\frac{(x^{1/4}y^{1/3}z^{1/2})^{1/4}}{(x^{3/2}y^{3/4}z^{2/3})^{1/3}} = \frac{1}{x^{\frac{63}{144}}y^{\frac{24}{144}}z^{\frac{14}{144}}}$

34. $\frac{(x^{1/2}y^{3/4})^{1/3}(x^{1/4}y^{2/3})^{1/2}}{(x^{5/3}y^{2/3})^{1/4}} = \frac{y^{\frac{10}{24}}}{x^{\frac{3}{24}}}$