

Name: _____

Exponents (positive, negative, zero)**Why are those Exponents up on Top!!!**

Definition: An exponent is a number in the top-right hand corner that **TELLS** us how many times to multiply the number it is on by **ITSELF**.

Simplify:

1. $\frac{x^3}{x}$

6. $\frac{8w^3z^5}{4z^7}$

11. $\frac{15r^3d^5}{25r^5d^3}$

2. $(m^2)^4$

7. $(7r^4)(5r^2)$

12. $(5y^4)^3$

3. w^5w^3

8. $(4r)^3$

13. $(6x^2r^4)^3$

4. $r^5(r^2)^3$

9. $5y^2y^4$

14. $(2h^2)^3(9h^4)$

5. $\frac{8v^2}{4v^5}$

10. $\frac{g^5p^7y}{g^2py^4}$

15. $\left(\frac{8x^2}{10x^5}\right)^3$

Definition: Any number to the zero power has a value of 1.

16. r^0

19. $2r(4r^3)^0$

22. $(8p^2)^0n^0$

17. $6w^0$

20. $(2f^3t^0)^3$

23. $7y^3(4y^4)^0$

18. $\frac{7x^0}{14x^5}$

21. $\left(\frac{10m^5}{24m^8}\right)^0$

24. $\left(\frac{6r^0}{(5r^4)^0}\right)^2$

Definition: To remove the negative from an exponent requires that you find the reciprocal of whatever the negative exponent is referring to.

25. 8^{-2}

32. y^5y^{-2}

39. $6(3^{-2})$

26. m^{-3}

33. h^4h^{-1}

40. $(-3^4)(-3)^{-3}$

27. $5c^{-1}$

34. $5m^{-2}m^{-3}$

41. $-5pz^{-2}p^{-4}z^{-1}$

28. $4h^4p^{-3}$

35. $(-5)^{-4}$

42. $2g^{-3}(-2g^2)^{-1}$

29. $\frac{v^7}{v^4}$

36. $\frac{y^{-5}}{y^{-2}}$

43. $\frac{7v^{-2}w^0z^3}{21v^{-5}w^{-1}z}$

30. $\frac{x^3}{x^{-2}}$

37. $\frac{6p^{-1}}{-2p^2}$

44. $\frac{5d(3d^2)^{-1}}{-4d^{-5}}$

31. $\frac{g^{-3}}{g^4}$

38. $\frac{k^4r^{-3}}{k^{-3}r^5w}$

45. $\left(\frac{-6(5m^{-4})^{-3}}{8(24m^8)^{-1}}\right)^0$

Answers on Back

Name: Answers

Exponents (positive, negative, zero)

Why are those Exponents up on Top!!!

Definition: An exponent is a number in the top-right hand corner that **TELLS** us how many times to multiply the number it is on by **ITSELF**.

Simplify:

1. $\frac{x^3}{x} = x^2$

2. $(m^2)^4 = m^8$

3. $w^5 w^3 = w^8$

4. $r^5 (r^2)^3 = r^{11}$

5. $\frac{8v^2}{4v^5} = \frac{2}{v^3}$

6. $\frac{8w^3 z^5}{4z^7} = \frac{2w^3}{z^2}$

7. $(7r^4)(5r^2) = 35r^6$

8. $(4r)^3 = 64r^3$

9. $5y^2 y^4 = 5y^6$

10. $\frac{g^3 p^7 y}{g^2 p y^4} = \frac{g^1 p^6 y^3}{y^3}$

11. $\frac{15r^3 d^5}{25r^5 d^3} = \frac{3d^2}{5r^2}$

12. $(5y^4)^3 = 125y^{12}$

13. $(6x^2 r^4)^3 = 216x^6 r^{12}$

14. $(2h^2)^3 (9h^4) = 72h^{10}$

15. $\left(\frac{8x^2}{10x^5}\right)^3 = \frac{64}{125x^9}$

Definition: Any number to the zero power has a value of 1.

16. $r^0 = 1$

17. $6w^0 = 6$

18. $\frac{7x^0}{14x^5} = \frac{1}{2x^5}$

19. $2r(4r^3)^0 = 2r$

20. $(2f^3 t^0)^3 = 8f^9$

21. $\left(\frac{10m^3}{24m^5}\right)^0 = 1$

22. $(8p^2)^0 n^0 = 1$

23. $7y^3 (4y^4)^0 = 7y^3$

24. $\left(\frac{6r^0}{(5r^4)^0}\right)^2 = 36$

Definition: To remove the negative from an exponent requires that you find the reciprocal of whatever the negative exponent is referring to.

25. $8^{-2} = \frac{1}{64}$

26. $m^{-3} = \frac{1}{m^3}$

27. $5c^{-1} = \frac{5}{c}$

28. $4h^4 p^{-3} = \frac{4h^4}{p^3}$

29. $\frac{v^7}{v^4} = v^3$

30. $\frac{x^3}{x^{-2}} = x^5$

31. $\frac{g^{-3}}{g^4} = \frac{1}{g^7}$

32. $y^3 y^{-2} = y^1$

33. $h^4 h^{-1} = h^3$

34. $5m^{-2} m^{-3} = \frac{5}{m^5}$

35. $(-5)^{-4} = \frac{1}{625}$

36. $\frac{y^{-3}}{y^{-2}} = \frac{1}{y^1}$

37. $\frac{6p^{-1}}{-2p^2} = -\frac{3}{p^3}$

38. $\frac{k^4 r^{-3}}{k^{-3} r^5 w} = \frac{k^7}{r^8 w}$

39. $6(3^{-2}) = \frac{2}{3}$

40. $(-3^4)(-3)^{-3} = -3$

41. $-5pz^{-2} p^{-4} z^{-1} = \frac{-5}{p^5 z^3}$

42. $2g^{-3} (-2g^2)^{-1} = \frac{-1}{g^5}$

43. $\frac{7v^{-2} w^0 z^3}{21v^{-5} w^{-1} z} = \frac{v^3 w z^2}{3}$

44. $\frac{5d(3d^2)^{-1}}{-4d^{-5}} = -\frac{5d^4}{12}$

45. $\left(\frac{-6(5m^{-4})^{-3}}{8(24m^5)^{-1}}\right)^0 = 1$