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Section 1.5

Exponent Rules

Jan. 14, 2013

1. $5^3 \times 5^4 = 5^{3+4} = 5^7$ When you multiply exponents to the same base, you add them.

3. $7^5 \times 7^5 = 7^{10}$

5. $4^2 \times 4^9 = 4^{11}$

$$10. \quad 4^5 \div 4^3$$

$$= 4^{5-3}$$

$$= 4^2$$

When you divide exponents to the same base, subtract them

$$12. \quad 9^2 \div 9^2 = 1$$

$$= 9^0$$

$$= 1$$

Anything to the power of zero equals one...

18. $(2^3)^4 \Rightarrow (2^3)(2^3)(2^3)(2^3)$

$$= 2^{12}$$

Power : multiply
the exponents

20. $(4^2)^7$
 $= 4^{14}$

$$22. (5^4)^4 = 5^{16}$$

$$27. 5^3 \times 5^x = 5^7$$

$$x = 4$$

$$29. 8^x \times 8^2 = 8^8$$

$$x = 6$$

$$33. t^x \times t^3 = t^6$$

$$x = 3$$

33a

$$\left(-\frac{2}{3}\right)^5$$

$$= \left(\frac{-2^5}{3^5}\right)$$

Evaluate

$$= \frac{-32}{243}$$

Power of a Quotient
Power: multiply
with exponent
of both numerator
↓ denominator

$$(-2)^5$$

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Zero + Negative Exponents

Jan 14

$$1. \quad 5^0 = 1$$

$$3. \quad \frac{3^{-1}}{1}$$

Negative Exponents

FLIP

$$8. \quad \frac{1}{8^{-1}} = 8$$

$$\frac{1}{3^{-1}} = \frac{1}{\frac{1}{3}} = 3$$

$$13. \quad \frac{1}{3^{-1}} = \frac{3^1}{1} = 3$$

$$16. \quad \frac{2^{-3}}{1}$$

Express with a
positive exponent.

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

$$20. \quad \frac{1^{-4}}{\frac{1}{x}}$$

$$26. \quad \frac{1}{5^{-4}} \\ = \frac{5^4}{1}$$

28. Express as a power

$$7^4 \times 7^5$$
$$= 7^9$$

29. $9^6 \times 9^{-4}$

$$= 9^2$$

32. $5^{-7} \div 5^{-2}$

$$= 5^{-7 - (-2)}$$
$$= 5^{-7 + 2}$$
$$= 5^{-5}$$

$$\frac{5^{-5}}{1}$$
$$= \frac{1}{5^5}$$

$$34. (3^3)^4 = 3^{12}$$

$$36. (8^{-1})^{-5} = 8^5$$

$$39. 3^{-5} \times 3^{-3} \times 3 = 3^{-6} = \frac{1}{3^6}$$

$$41. 8^4 \times 8^{-5} \div 8^{-2} = 8^{4+(-5)-(-2)} = 8^{-1+2} = 8^1 = 8$$

$$43. (-3)^{-6} \div (-3)^{-2} \times (-3)^4$$

$$= (-3)^{-6 - (-2) + 4}$$

$$= (-3)^{-6 + 2 + 4}$$

$$= (-3)^0$$

$$= (-3)^0$$

$$46. 2^4 \times 2^{-3}$$

$$= 2^{4 + (-3)}$$

$$= 2^1$$

$$49. 6^{-2} \div 6^0$$

$$= 6^{-2 - 0}$$

$$= 6^{-2}$$

$$= \frac{1}{6^2}$$

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