Monomial is a number, variable or product of a number and one or more variables with nonnegative integer exponents.

rules of exponents

The laws or properties of exponents set down rules for operations involving exponents.

An exponent shows how many times a base is multiplied.

Property	Examples
zero exponent property For $a \neq 0$: $a^0 = 1$	$5^0 = 1$ $5^0 \times 5^2 = 5^{(0+2)} = 5^2 = 25$
negative exponent property For $a \neq 0$: $a^{-b} = 1/a^b$	$5^{-2} = 1/5^2 = 1/25 = 0.04$ $5^{-2} \times 5^4 = 5^{(-2+4)} = 5^2 = 25$
product of powers property To multiply two powers having the same base, add the exponents. For $a \neq 0$: $a^b \times a^c = a^{(b+c)}$	$3^3 \times 3^5 = 3^{(3+5)} = 3^8$ $5^2 \times 5^4 = 5^{(2+4)} = 5^6$
quotient of powers property To divide two powers having the same base, subtract the exponents. For $a \neq 0$: $a^{-b} / a^{-c} = a^{b-c}$ or $\frac{a^{-b}}{a^{-c}} = a^{b-c}$	$3^4 / 3^2 = 3^{(4-2)} = 3^2 = 9$ $5^3 / 5^2 = 5^{(3-2)} = 5^1 = 5$
power of a product property To find the power of a product, either find the power of each factor and multiply or multiply the factors and raise the product to the power. For $a, b \neq 0$: $a^c \times b^c = (ab)^c$ or $a^c b^c = (ab)^c$	$2^2 \times 6^2 = (2 \times 6)^2 = 12^2$ $2^2 \times 6^2 = (2 \times 6) \times (2 \times 6) = 12^2$
power of a quotient property Similar to power of a product property. Cancelling may be used. For $a, b \neq 0$: $\frac{a^c}{b^c} = \left(\frac{a}{b}\right)^c$	$\left(\frac{a}{3}\right)^3 = \frac{a^3}{3^3} = \frac{a^3}{27}$ $\frac{20^3}{4^3} = \frac{5 \cdot \cancel{4} \cdot 5 \cdot \cancel{4} \cdot 5 \cdot \cancel{4}}{\cancel{4} \cdot \cancel{4} \cdot \cancel{4}} = 5^3$
power of a power property To find a power of a power, multiply the exponents. For a, b and c: $(a^b)^c = a^{bc}$	$(3^2)^4 = (3^2)(3^2)(3^2)(3^2) = 3^{2+2+2+2} = 3^8$ $(2^3)^3 = (2)^{3 \times 3} = 2^9$
rational (fractional) exponents The exponent $^c/_b$ works like a square root. For a, b and c: $a^{\frac{c}{b}} = \sqrt[b]{a^c} = \left(\sqrt[b]{a}\right)^c$	$5^{1/2} = 5^{1/2} \times 5^{1/2} = 5^{(1/2+1/2)} = 5^1 = 5$ $7^{1/3} = 7^{1/3} \times 7^{1/3} \times 7^{1/3} = 7^{(1/3+1/3+1/3)} = 7^1 = 7$