

4.5 - Negative Exponents

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The reciprocal of $\frac{a}{b}$ is $\frac{b}{a}$.

$$\Rightarrow X^{-n} = \frac{1}{X^n}$$

↳ Take reciprocal and make exponent positive.

ex: $3^{-2} = \frac{1}{3^2} = \boxed{\frac{1}{9}}$

ex: $\left(\frac{-3}{4}\right)^{-3} = \left(\frac{4}{-3}\right)^3 = \left(\frac{4}{-3}\right)\left(\frac{4}{-3}\right)\left(\frac{4}{-3}\right) = \frac{64}{-27} = \frac{-64}{27} = -\frac{64}{27}$

ex: $\left(\frac{9}{16}\right)^{-3/2} = \left(\frac{16}{9}\right)^{3/2}$

Annotations: "power" points to 3, "index" points to 2. A blue arrow points from the 3 to the exponent of the inner fraction, and a red arrow points from the 2 to the root symbol.

$$= \sqrt[2]{\left(\frac{16}{9}\right)^3} = \left[\sqrt{\frac{16}{9}}\right]^3 = \left[\frac{\sqrt{16}}{\sqrt{9}}\right]^3$$

$$= \left[\frac{4}{3}\right]^3 = \left(\frac{4}{3}\right)\left(\frac{4}{3}\right)\left(\frac{4}{3}\right) = \frac{64}{27}$$

HW: Pg. 233

4, 6-9, 11, 14