

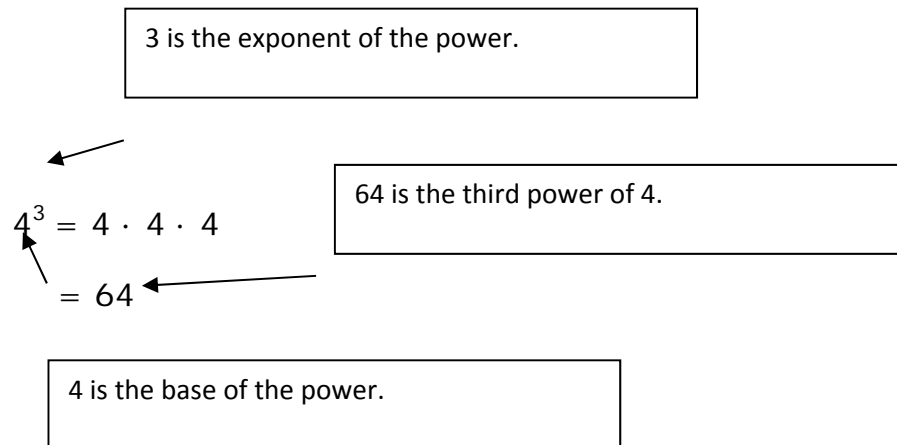
Sec. 4.4 – Fractional Exponents and Radicals

Powers with Integer Bases

A **power** with a positive integer exponent represents repeated multiplication; for example, the power $2^5 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$.

A power has a **base** and an **exponent**.

The exponent represents the number of equal factors in a power.



You can use mental math to calculate powers such as 2^5 and a calculator to calculate powers such as $(-9)^5$.

1. Evaluate each power without using a calculator.

a) $1000^{\frac{1}{3}}$

b) $0.25^{\frac{1}{2}}$

c) $(-8)^{\frac{1}{3}}$

d) $\left(\frac{16}{81}\right)^{\frac{1}{4}}$

2. a) Write $26^{\frac{2}{5}}$ in radical form in 2 ways.

b) Write $\sqrt{6^5}$ and $(\sqrt[4]{19})^3$ in exponent form.

3. Evaluate.

a) $0.01^{\frac{3}{2}}$

b) $(-27)^{\frac{4}{3}}$

c) $81^{\frac{3}{4}}$

d) $0.75^{1.2}$

4. Use the formula $b = 0.01m^{\frac{2}{3}}$ to estimate the brain mass of each animal.

a) a moose with a body mass of 512 kg

b) a cat with a body mass of 5 kg