

Section 6.2 Evaluate Powers with Integer Exponents

- Evaluate each power without a calculator. Express each answer as a fraction.
a) 3^{-4} b) 12^{-2} c) 5^{-3} d) 20^{-1}
- Evaluate each power with a calculator. Express each answer as a fraction.
a) 11^{-3} b) 6^{-5} c) 4^{-6} d) 16^{-3}
- Express each fraction or decimal as a power with a negative exponent. For the base, use the smallest positive integer possible.
a) $\frac{1}{32}$ b) $\frac{1}{225}$ c) $\frac{1}{1000}$ d) 0.000 001
- Evaluate. Simplify answers as much as possible while leaving them as fractions.
a) $3^{-3} + 3^{-1}$ b) $(-1)^0 + (-1)^3$
c) $6^{-2} - 6^{-3}$ d) $(-2)^0 - (-2)^{-2}$
- Evaluate. Where fractions are used, leave answers in fraction form.
a) $\left(\frac{1}{2}\right)^{-3}$ b) $\left(\frac{5}{4}\right)^{-2}$
c) $(0.5)^{-4}$ d) $(0.001)^{-2}$
- Use the exponent rules to express each of the following as a single power.
a) $\frac{6^6 \times 6^{-3}}{6^8 \times 6^{-6}}$ b) $\frac{2^5 \times 2^{-4}}{2^{-3}}$
c) $\frac{\left(\frac{1}{3}\right)^9}{\left(\frac{1}{3}\right)^6 \times \left(\frac{1}{3}\right)^6}$ d) $\left[\left(\frac{2}{5}\right)\left(\frac{2}{5}\right)\right]^{-2}$
- A typical X-ray has a wavelength that is 0.000 000 01 cm in length. An infrared ray has a wavelength that is 10^5 times greater than that of an X-ray. Express the wavelength of an infrared ray as a power of base 10 with a negative exponent.
- Express 27^{-2} as a power with base 3.
- The A above middle C on a piano is tuned to a frequency of 440 Hz, and is sometimes called A440. What is the frequency of a note 2 octaves below A440?
- Find at least two pairs of integers x and y such that $(x^y)(y^x) = 1$ where x and y are not equal.
- Assign the values -4 , -2 , 2 , and 4 to p , q , r , and s such that the expression $\frac{p^q}{r^s}$ has a maximum value. Is there more than one answer? Explain.