1.5 Powers and Negative Exponents

Remember $\rightarrow$ $5^2 \div 5^3 = 5^{\boxed{-1}}$

$$\rightarrow \frac{5^2}{5^3} = \frac{\cancel{5} \times \cancel{5}}{\cancel{5} \times \cancel{5} \times 5} = \frac{1}{5}$$

so, $x^{-n} = \dfrac{1}{x^n}$ and $\dfrac{1}{x^{-n}} = x^n$

(take reciprocal of the base to make exponent positive)

Evaluate

ex. 1. $2^{-4} = \dfrac{1}{2^4} = \dfrac{1}{16}$

2. $\left(-\dfrac{3}{4}\right)^{-2} = \left(-\dfrac{4}{3}\right)^2 = \dfrac{16}{9}$

3. $8^{-\frac{2}{3}} = \dfrac{1}{8^{\frac{2}{3}}} = \dfrac{1}{2^2} = \dfrac{1}{4}$

4. $(0.2)^{-3} = \left(\dfrac{1}{5}\right)^{-3} = 5^3 = 125$

$\dfrac{2}{10} = \dfrac{1}{5}$

$(10\ldots)^{-2}$ $(\ldots)^{-2}$ $(5\ldots)^{2}$ $25\ldots$

5. $\left(\frac{18}{15}\right)^{-2} = \left(\frac{6}{5}\right)^{-2} = \left(\frac{5}{6}\right)^{2} = \frac{25}{36}$

reduce to lowest terms

6. $81^{-0.75} = 81^{-\frac{3}{4}} = \frac{1}{81^{\frac{3}{4}}} = \frac{1}{\left(\sqrt[4]{81}\right)^3}$

$-\frac{75}{100} = -\frac{3}{4}$

$= \frac{1}{3^3} = \frac{1}{27}$

7. $\left(-\frac{125}{64}\right)^{-\frac{2}{3}} = \left(-\frac{64}{125}\right)^{\frac{2}{3}}$

$= \left(\sqrt[3]{-\frac{64}{125}}\right)^2$

$= \left(-\frac{4}{5}\right)^2$

$= \frac{16}{25}$

p55 # 4–12, 14(pick 4)