Math 101, Littlefield
Key for Homework: Powers and Roots

What is the value of *N* in the following expressions?

a. $\frac{x}{\sqrt{x}} = x^N$ solution $\frac{x}{\sqrt{x}} = \frac{x^1}{x^{1/2}} = x^{1-1/2} = x^{1/2}, \quad N = 1/2$

b. $\frac{x}{\sqrt[3]{x}} = x^N$ solution $\frac{x}{\sqrt[3]{x}} = \frac{x^1}{x^{1/3}} = x^{1-1/3} = x^{2/3}, \quad N = 2/3$

c. $x^3 \times x^{1.4} = x^N$ solution $x^3 \times x^{1.4} = x^{3+1.4} = x^{4.4}, \quad N = 4.4$

d. $x^2\sqrt{x} = x^N$ solution $x^2\sqrt{x} = x^2 \cdot x^{1/2} = x^{2+1/2} = x^{2\,1/2}, \quad N = 2\,1/2$

e. $\frac{1}{x^{2.5}} = x^N$ solution $\frac{1}{x^{2.5}} = \frac{x^0}{x^{2.5}} = x^{0-2.5} = x^{-2.5}, N = -2.5$

Hint: You can check your results numerically using Excel. For example, you can confirm that

$$\frac{x^4}{x \cdot \sqrt[3]{x}} = x^{4-(1+1/3)} = x^{8/3}$$

by testing with x = 15 and noting that Excel computes =15^4/(15*(15^(1/3))), =15^(4-(1+1/3)), and =15^(8/3) as all being the same value (1368.495449).

x=15 is of course pulled from the air. Any value greater than 0 and different from 1 will work.

(Yes, Excel's formula notation looks like ugly gobbledygook! Notation is better if it's pretty. But even ugly notation can be useful.)