- Isolate
- Raise each side to the reciprocal power

Name Schlansky
Mr. Schlansky

Date _____
Algebra II

Constant Exponential Equations

Solve the following equations for x:

1. $\left(x^{\frac{1}{2}}\right)^2 = (7)^2$

$x = 49$

2. $\left(x^{\frac{2}{3}}\right)^{\frac{3}{2}} = (4)^{\frac{3}{2}}$

$x = 8$

3. $\left(x^{-2}\right)^{-\frac{1}{2}} = \left(\frac{25}{121}\right)^{-\frac{1}{2}}$

$x = \left(\frac{121}{25}\right)^{\frac{1}{2}}$

$x = \frac{11}{5}$

4. $\left(a^{\frac{1}{4}}\right)^{-4} = (2)^{-4}$

$a = \frac{1}{16}$

5. $3x^{\frac{2}{5}} - 11 = 289$

$+11 \quad +11$

$\frac{3x^{\frac{2}{5}}}{3} = \frac{300}{3}$

$\left(x^{\frac{2}{5}}\right)^{\frac{5}{2}} = (100)^{\frac{5}{2}}$

$x = 100000$

6. $x^{\frac{1}{5}} - 6 = -8$

$+6 \quad +6$

$\left(x^{\frac{1}{5}}\right)^5 = (-2)^5$

$x = -32$

7. $x^{\frac{4}{3}} - 11 = 5$

$+11 \quad +11$

$(x^{\frac{4}{3}})^{\frac{3}{4}} = (16)^{\frac{3}{4}}$

$x = 8$

8. $(2x)^3 + 4 = 31$

$-4 \quad -4$

$((2x)^3)^{\frac{1}{3}} = (27)^{\frac{1}{3}}$

$\frac{2x}{2} = \frac{3}{2}$

$x = \frac{3}{2}$

9. $y^{-3} = \left(\frac{125}{8}\right)$

$(y^{-3})^{-\frac{1}{3}} = \left(\frac{125}{8}\right)^{-\frac{1}{3}}$

$y = \left(\frac{8}{125}\right)^{\frac{1}{3}}$

$y = \frac{2}{5}$

10. $4x^{\frac{2}{3}} - 5 = 95$

$+5 \quad +5$

$\frac{4x^{\frac{2}{3}}}{4} = \frac{100}{4}$

$(x^{\frac{2}{3}})^{\frac{3}{2}} = (25)^{\frac{3}{2}}$

$x = 125$

11. Given the equal terms $\sqrt[3]{x^5}$ and $y^{\frac{5}{6}}$, determine and state y, in terms of x.

radicals are fractional exponents

$x^{\frac{5}{3}} = y$

$(x^{\frac{5}{3}})^{\frac{6}{5}} = (y)^{\frac{6}{5}}$

$x^{\frac{30}{15}} = y$

$x^2 = y$