Algebra RH Answer Key **HW #**

1) Evaluate and simplify each of the following:

a) $100^{\frac{1}{2}}$

$\sqrt{100}$

$\boxed{10}$

b) $(-125)^{\frac{1}{3}}$

$\sqrt[3]{-125}$

$\boxed{-5}$

c) $-4^{\frac{3}{2}}$

$-(\sqrt{4})^3$

-2^3

$\boxed{-8}$

d) $4^{\frac{3}{2}}$

$(\sqrt{4})^3$

2^3

$\boxed{8}$

e) $\left(\frac{100}{9}\right)^{-\frac{1}{2}}$

$\left(\frac{9}{100}\right)^{\frac{1}{2}}$

$\sqrt{\frac{9}{100}} = \boxed{\frac{3}{10}}$

f) $\left(\frac{8}{27}\right)^{\frac{1}{3}}$

$\sqrt[3]{\frac{8}{27}}$

$\boxed{\frac{2}{3}}$

g) $\left(\frac{64}{9}\right)^{-\frac{1}{2}}$

$\left(\frac{9}{64}\right)^{\frac{1}{2}}$

$\sqrt{\frac{9}{64}} = \boxed{\frac{3}{8}}$

h) $\left(\frac{16}{25}\right)^{\frac{3}{2}}$

$\left(\sqrt{\frac{16}{25}}\right)^3$

$\left(\frac{4}{5}\right)^3 = \boxed{\frac{64}{125}}$

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

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

$\sqrt[4]{\frac{16}{81}} = \boxed{\frac{2}{3}}$

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

$\sqrt[3]{\frac{125x^3}{8y^3}}$

$\boxed{\frac{5x}{2y}}$

k) $\left(\frac{1000x^3}{27y^3}\right)^{-\frac{1}{3}}$

$\left(\frac{27y^3}{1000x^3}\right)^{\frac{1}{3}} \rightarrow \sqrt[3]{\frac{27y^3}{1000x^3}}$

$\boxed{\frac{3y}{10x}}$

2) Solve each of the following equations for the indicated variable. Show all work!

a) $\left(x^{\frac{1}{2}}\right)^2 = (9)^2$

$\boxed{x = 81}$

b) $\frac{81x^{\frac{1}{3}}}{81} = \frac{81}{81}$

$\left(x^{\frac{1}{3}}\right)^3 = (1)^3$

$\boxed{x = 1}$

c) $\frac{50}{5} = \frac{5x^{\frac{1}{2}}}{5}$

$(10)^2 = \left(x^{\frac{1}{2}}\right)^2$

$\boxed{100 = x}$

d) $\frac{4b^{-\frac{2}{3}}}{4} = \frac{81}{4}$

$\left(b^{-\frac{2}{3}}\right)^{-\frac{3}{2}} = \left(\frac{81}{4}\right)^{-\frac{3}{2}}$

$b = \left(\frac{4}{81}\right)^{\frac{3}{2}}$

$b = \left(\sqrt{\frac{4}{81}}\right)^3$

$b = \left(\frac{2}{9}\right)^3$ $\boxed{b = \frac{8}{729}}$

e) $\frac{100h^{-\frac{2}{3}}}{100} = \frac{9}{100}$

$\left(h^{-\frac{2}{3}}\right)^{-\frac{3}{2}} = \left(\frac{9}{100}\right)^{-\frac{3}{2}}$

$h = \left(\frac{100}{9}\right)^{\frac{3}{2}}$

$h = \left(\sqrt{\frac{100}{9}}\right)^3$

$h = \left(\frac{10}{3}\right)^3$ $\boxed{h = \frac{1000}{27}}$

f) $\frac{2x^{-4}}{2} = \frac{162}{2}$

$\left(x^{-4}\right)^{-\frac{1}{4}} = (81)^{-\frac{1}{4}}$

$x = \left(\frac{1}{81}\right)^{\frac{1}{4}}$

$x = \sqrt[4]{\frac{1}{81}}$

$\boxed{x = \frac{1}{3}}$