

$$a^m \cdot a^n = a^{m+n}$$

~~9
23~~ ~~25
22~~
~~105~~

$$64^{\frac{1}{3}} \cdot 64^{\frac{2}{3}} = 64^{\frac{1}{3} + \frac{2}{3}} = 64^1$$

$$\downarrow \quad \downarrow$$

$$\sqrt[3]{64} \cdot \sqrt[3]{64^2}$$

$$\downarrow \quad \downarrow$$

$$4 \cdot 16$$

$$64$$

$$64^{\frac{1}{4}} \cdot 64^{\frac{1}{3}}$$

$$64^{\frac{3}{12} + \frac{4}{12}}$$

$$64^{\frac{7}{12}}$$

$$32^{\frac{1}{5}} \cdot 32^{\frac{2}{5}}$$

$$32^{\frac{3}{5}}$$

$$\sqrt[5]{32^3}$$

$$2^3$$

$$8$$

$$(a^m)^n = a^{m \cdot n}$$

$$(7^{\frac{1}{2}})^4 = 7^{\frac{1}{2} \cdot 4} = 7^2 = 49$$

$$(\sqrt{7})^4$$

$$\sqrt{7} \cdot \sqrt{7} \cdot \sqrt{7} \cdot \sqrt{7}$$

$$\downarrow \quad \downarrow$$

$$7 \cdot 7$$

$$(49)$$

$$(ab)^m = a^m b^m$$

$$(9 \cdot 3)^{\frac{1}{2}} = 9^{\frac{1}{2}} \cdot 3^{\frac{1}{2}}$$
$$27^{\frac{1}{2}} = \sqrt{9} \cdot \sqrt{3}$$
$$3\sqrt{3}$$

$$\sqrt{27}$$
$$\sqrt{9} \sqrt{3}$$
$$3\sqrt{3}$$

$$4$$
$$4$$
$$4^{\frac{4}{3}x}$$
$$4^{\frac{4}{3}x}$$
$$\frac{4}{3}x$$

$$\left(8^{15} x \right)^{-\frac{1}{3}}$$

$$8^{-\frac{1}{3}} x^{-5}$$

$$\frac{1}{\phantom{8^{1/3} x^5}}$$

$$8^{1/3} x^5$$

$$\left\{ \frac{1}{\sqrt[3]{8} x^5} \right\}$$

$$\frac{1}{2x^5}$$

(8) (12)

$$(16y^8)^{\frac{3}{4}}$$

Hint: Consider prop. 1st ?

$$\left\{ \begin{array}{l} (ab)^n \\ a^m)^n \\ a^{-n} \\ a^{\frac{\text{Power}}{\text{Root}}} \end{array} \right\}$$

$$16^{\frac{3}{4}} \cdot y^6$$

$$\frac{1}{16^{\frac{3}{4}}} \cdot y^6$$

$$\frac{1}{(\sqrt[4]{16})^3} \cdot y^6$$

$$\frac{1}{8} \cdot y^6$$

$$\frac{1}{8} y^6$$