Simplifying Harder Algebraic Indices

Write each of these in index form:

(a) $\sqrt{4x}$ (b) $\sqrt[3]{27x}$

(c) $\sqrt{25x^3}$ (d) $\sqrt[3]{64x^2}$

(e) $\left(\sqrt[3]{8x}\right)^2$ (f) $\left(\sqrt{16x^2}\right)^3$

(a) $2x^{1/2}$ (b) $3x^{1/3}$

(c) $5x^{3/2}$ (d) $4x^{2/3}$

(e) $4x^{2/3}$ (f) $64x^3$

Write each of these in index form:

(a) $\sqrt{\frac{9}{x}}$ (b) $\frac{1}{\sqrt[3]{125x}}$

(c) $\frac{1}{\sqrt{16x^3}}$ (d) $\left(\frac{2}{\sqrt{x}}\right)^3$

(e) $\left(\frac{6}{\sqrt[3]{x}}\right)^2$ (f) $\left(\frac{2}{\sqrt{9x^3}}\right)^4$

(a) $3x^{-1/2}$ (b) $\frac{1}{5}x^{-1/3}$

(c) $\frac{1}{4}x^{-3/2}$ (d) $8x^{-3/2}$

(e) $36x^{-2/3}$ (f) $\frac{16}{81}x^{-6}$

Write each of these in index form:

(a) $(27x^2)^{2/3}$ (b) $(4x^6)^{3/2}$

(c) $(8x^9)^{-2/3}$ (d) $\left(49x^{2/3}\right)^{-3/2}$

(e) $(125x^3y^{12})^{2/3}$

(f) $\left(\frac{16}{9x^4}\right)^{-3/2}$

(a) $9x^{4/3}$ (b) $8x^9$

(c) $\frac{1}{4}x^{-6}$ (d) $\frac{1}{343}x^{-1}$

(e) $25x^2y^8$

(f) $\frac{27}{64}x^{-6}$

Simplify each of the following:

(a) $4y^{-3} \times \left(\frac{8}{y^9}\right)^{2/3}$

(b) $\left(\sqrt[3]{27y}\right)^4 \times \frac{3}{y^2}$

(c) $\left(\frac{9x^2}{y^6}\right)^{-3/2} \times \left(\frac{y}{3x^2}\right)^4$

(d) $\left(\frac{2x^4 \times 4x^5}{9y \times \sqrt{9y}}\right)^{2/3}$

(e) $\left(\sqrt[3]{64x}\right)^{-2} \div \left(\frac{27x^2}{8}\right)^{2/3}$

(a) $16y^{-9}$ or $\frac{16}{y^9}$

(b) $243y^{-2/3}$

(c) $\frac{1}{2187}x^{-11}y^{13}$ or $\frac{y^{13}}{2187x^{11}}$

(d) $\frac{4x^6}{9y}$ or $\frac{4}{9}x^6y^{-1}$

(e) $\frac{1}{36}x^{-2}$ or $\frac{1}{36x^2}$