Simplifying Algebraic Indices

Write as a single power of x:

(a) $\sqrt{x^3}$ (b) $\left(\sqrt{x}\right)^3$

(c) $\sqrt[3]{x^2}$ (d) $\sqrt[4]{x}$

(e) $\left(\sqrt[3]{x}\right)^4$ (f) $\sqrt{x^5}$

Write as a single power of x:

(a) $\dfrac{1}{\sqrt[3]{x}}$ (b) $\left(\dfrac{1}{\sqrt[3]{x}}\right)^2$

(c) $\dfrac{1}{\sqrt{x^3}}$ (d) $\left(\dfrac{1}{\sqrt{x}}\right)^3$

(e) $\left(\dfrac{1}{\sqrt[3]{x}}\right)^5$ (f) $\dfrac{1}{\sqrt[2]{x^7}}$

Write as a single power of x:

(a) $x^2 \times \sqrt{x}$ (b) $\sqrt[3]{x} \times x$

(c) $\dfrac{x^4}{\sqrt{x}}$ (d) $\dfrac{\sqrt[3]{x}}{x}$

(e) $\sqrt{\dfrac{1}{x^5}}$ (f) $\dfrac{1}{x\sqrt{x}}$

(a) Given that
$$\frac{y^4 \times \sqrt{y}}{\sqrt{y^5}} = y^a$$
find the value of a.

(b) Given that
$$\frac{1}{\sqrt[3]{y^2}} \times \left(y\sqrt{y}\right)^4 = y^b$$
find the value of b.

(c) Given that
$$\left(\sqrt[2]{y^3}\right)^3 \times \frac{1}{y^c} = \left(y^2 \times \sqrt[4]{y^3}\right)^{-2}$$
find the value of c.