

8. Simplify each of these

(i) $\frac{x^{\frac{1}{2}} + x^{-\frac{1}{2}}}{x^{\frac{1}{2}}}$

(ii) $(x + x^{\frac{1}{2}})(x - x^{\frac{1}{2}})$

(iii) $\frac{\sqrt{x} + \sqrt{x^3}}{\sqrt{x}}$

Part (i)

$$\frac{x^{\frac{1}{2}}}{x^{\frac{1}{2}}} + \frac{x^{-\frac{1}{2}}}{x^{\frac{1}{2}}}$$

$$1 + \frac{\left(\frac{1}{\sqrt{x}}\right)}{\sqrt{x}}$$

$$1 + \frac{1}{\sqrt{x}} \cdot \frac{1}{\sqrt{x}}$$

$$1 + \frac{1}{x} \quad \checkmark$$

$$\text{or } \frac{x+1}{x}$$

easier way?

$$\frac{(x^{\frac{1}{2}} + x^{-\frac{1}{2}})x^{\frac{1}{2}}}{(x^{\frac{1}{2}})x^{\frac{1}{2}}}$$

$$\frac{x + x^0}{x}$$

$$= \frac{x+1}{x}$$

(iii) $\frac{(\sqrt{x} + (\sqrt{x})^3)\sqrt{x}}{(\sqrt{x})\sqrt{x}}$

$$= \frac{x + x^3}{x}$$

$$= 1 + x^2$$

note

$$\sqrt{x^3} = (\sqrt{x})^3$$

$$x^{3/2} = x^{3/2}$$