

Check Point 1

1) Find the integer representation of each of the following, if they exist.

$$\begin{array}{llll}
 \text{1) (a) } 25^{\frac{3}{2}} & \text{1) (b) } (-27)^{\frac{1}{3}} & \text{1) (c) } \left(-\frac{1}{8}\right)^{-\frac{1}{3}} & \text{1) (d) } (-16)^{\frac{1}{4}} \\
 = (5^2)^{\frac{3}{2}} & = (-3^3)^{\frac{1}{3}} & = \left(-\frac{1}{2^3}\right)^{-\frac{1}{3}} & = (-2^4)^{\frac{1}{4}} \\
 = (5)^3 & = (-3)^1 & = -2 & = (-2)^1 \quad [(-2)^4]^{\frac{1}{4}} \\
 = 125 & = -3 & = -2 & = -2 \\
 & \left[(-3)^3\right]^{\frac{1}{3}} & \left[(-2)^3\right]^{-\frac{1}{3}} & \\
 & = -3 & = -2 & \\
 & \text{cannot write like this.} & &
 \end{array}$$

2. Simplify

$$\begin{array}{ll}
 \text{2. (a) } \frac{9^{\frac{3}{2}} x^4 y^{-\frac{1}{2}} z^2}{8^{\frac{1}{3}} x^{\frac{1}{2}} y^2 z^{-1}} & \text{2. (b) } \left[\left((t-1)^{\frac{1}{3}} \right)^{-6} \right]^{-\frac{1}{4}} \\
 = \frac{(3^2)^{\frac{3}{2}} (x^4) (y^{-\frac{1}{2}}) z^2}{(2^3)^{\frac{1}{3}} (x^{\frac{1}{2}}) (y^2) z^{-1}} & = \left((t-1)^{\frac{1}{3}} \right)^{\frac{6}{4} \cdot \frac{3}{2}} \\
 = \frac{(3^3)(2^{-1})(x^{4-\frac{1}{2}})(y^{-\frac{1}{2}-2})(z^{2-(-1)})}{1} & = \left((t-1)^{\frac{1}{3}} \right)^{\frac{9}{2}} \\
 = \frac{27}{2} x^{\frac{7}{2}} y^{-\frac{5}{2}} z^3 & = (t-1)^{\frac{1}{2}} \\
 & \text{cannot write like this.}
 \end{array}$$

$$\begin{array}{l}
 \frac{(3^2)^{\frac{3}{2}} x^4 y^{-\frac{1}{2}} z^2}{(2^3)^{\frac{1}{3}} x^{\frac{1}{2}} y^2 z^{-1}} \\
 = \frac{3^3 x^4 y^{-\frac{1}{2}} z^2}{2 x^{\frac{1}{2}} y^2 z^{-1}} \\
 = \frac{27 x^{4-\frac{1}{2}} y^{-\frac{1}{2}-2} z^{2-(-1)}}{1}
 \end{array}$$

$$= \frac{27}{2} x^{4-\frac{1}{2}} y^{-\frac{1}{2}-2} z^{2-(-1)}$$