

1. a) 3 b) 4 c) 4

2. The index is telling you what root to take.

3. a) 128 b) 16 c) $\frac{256}{625}$ or 0.4096.

4. a) $\sqrt[4]{16}$ b) $\sqrt[3]{64}$ c) $\sqrt[5]{8000}$

$= \sqrt[4]{2 \times 2 \times 2 \times 2} = 2$

$= \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2} = 2 \times 2 = 4$

$= \sqrt[5]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2} = 2 \times 2 \times 2 = 8$

(d) $\sqrt[4]{4096}$

$\sqrt[4]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2} = 2 \times 2 \times 2 = 8$

(d) $\sqrt[4]{4096}$

$$\sqrt[4]{\underbrace{2 \times 2 \times 2 \times 2}_{2^4} \times \underbrace{2 \times 2 \times 2 \times 2}_{2^4} \times \underbrace{2 \times 2 \times 2 \times 2}_{2^4}}$$

$$2 \times 2 \times 2 = 8$$

6. a) $420 \rightarrow 2 \times 2 \times 3 \times 5 \times 7$
 $864 \rightarrow 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$

$$2 \times 2 \times 3 = 12$$

b) $36 \rightarrow 2 \times 2 \times 3 \times 3$
 $48 \rightarrow 2 \times 2 \times 2 \times 2 \times 3$
 $72 \rightarrow 2 \times 2 \times 2 \times 3 \times 3$

$$2 \times 2 \times 3 = 12$$

$$7. (a) \begin{array}{l} 12 \rightarrow 2 \times 2 \times 3 = 2^2 \times 3^1 \\ 40 \rightarrow 2 \times 2 \times 2 \times 5 = 2^3 \times 5^1 \end{array}$$

$$\begin{array}{l} 2^3 \times 3^1 \times 5^1 \\ 8 \times 3 \times 5 \\ = 120 \end{array}$$

$$(b) \begin{array}{l} 16 \rightarrow 2 \times 2 \times 2 \times 2 = 2^4 \\ 25 \rightarrow 5 \times 5 = 5^2 \\ 30 \rightarrow 2 \times 3 \times 5 = 2^1 \times 3^1 \times 5^1 \end{array}$$

$$\begin{array}{l} 2^4 \times 3^1 \times 5^2 \\ 16 \times 3 \times 25 \\ = 1200 \end{array}$$

8.

$$\sqrt[3]{74088}$$

$$\sqrt[3]{2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7 \times 7 \times 7}$$

$$2 \times 3 \times 7$$

$$= 42.$$

$$\begin{aligned} SA &= 6(L \times W) \\ &= 6(42 \times 42) \\ &= 10584 \end{aligned}$$

9. $SA = \cancel{6} (l \times w)$
 $\begin{array}{r} 5400 \\ \div 6 \\ \hline = 900 \end{array}$

↑ ↑
same.

$\sqrt[2]{900}$
 $\sqrt{2 \times 2 \times 3 \times 3 \times 5 \times 5}$
 $2 \times 3 \times 5$
 $= 30$

Volume = $L \times W \times H$
 $= 30 \times 30 \times 30$
 $= 27000 \text{ cm}^3$

10. $48 \rightarrow (2 \times 2 \times 2 \times 2 \times 3)$
 $60 \rightarrow (2 \times 2 \times 3 \times 5)$
 $84 \rightarrow (2 \times 2 \times 3 \times 7)$

GCF = $2 \times 2 \times 3$
 $= \underline{\underline{12}}$

12 Bags

11. a) $(4) \sqrt{12 \times 4 \times 4}$
 $= \sqrt{192}$

or $(4) \sqrt{12 \times 16}$
 $= \sqrt{192}$

b) $(5) \sqrt[3]{5 \times 5 \times 5}$
 $= \sqrt{125}$

or $(5) \sqrt{5 \times 25}$
 $= \sqrt{125}$

c) $\sqrt[3]{11 \times \underline{7 \times 7 \times 7}}$ or $\sqrt[3]{11 \times \underline{343}}$
 $\sqrt[3]{3773}$ $\sqrt[3]{3773}$

d) $\sqrt[5]{10 \times \underline{3 \times 3 \times 3 \times 3 \times 3}}$ or $\sqrt[5]{10 \times \underline{243}}$
 $= \sqrt[5]{2430}$ $= \sqrt[5]{2430}$

12. a) $\sqrt[4]{243}$
 $\sqrt[4]{\underline{3 \times 3 \times 3 \times 3} \times 3}$
 $= 3 \sqrt[4]{3}$

b) $\sqrt[5]{48}$
 $\sqrt[5]{\underline{2 \times 2 \times 2 \times 2} \times 3}$
 $= 10 \sqrt[5]{6}$

$$= 3^4 \sqrt{3}$$

$$= 10^3 \sqrt{6}$$

c) $\sqrt[3]{1080}$

$$\sqrt[3]{2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5}$$

$$2 \times 3 \sqrt[3]{5}$$

$$6 \sqrt[3]{5}$$

d) $\sqrt[5]{2592}$

$$\sqrt[5]{2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3}$$

$$2 \sqrt[5]{81}$$

13. $V = l \times w \times h$ same.
 $\swarrow \quad \downarrow \quad \searrow$

$$\sqrt[3]{1080}$$

$$\sqrt[3]{\cancel{2 \times 2 \times 2} \times \cancel{3 \times 3 \times 3} \times 5}$$

$$2 \times 3 \sqrt[3]{5}$$

$$\equiv \underline{\underline{6 \sqrt[3]{5}}}$$

14. $SA = \cancel{6}(l \times w)$ same.
 $\swarrow \quad \searrow$

$$\begin{array}{r} 37800 \\ \div 6 \\ \hline 6300 \end{array}$$

$$\sqrt{6300}$$

$$\sqrt{\cancel{2 \times 2} \times \cancel{3 \times 3} \times \cancel{5 \times 5} \times 7}$$

$$2 \times 3 \times 5 \sqrt{7}$$

$$= \underline{\underline{30 \sqrt{7}}}$$

15.

BSQ

$$c^2 = a^2 + b^2$$

$$c^2 = 4^2 + 6^2$$

$$c^2 = 16 + 36$$

$$\sqrt{c^2} = \sqrt{52}$$

$$c = \sqrt{52} \cdot 3$$

RIP

$$c^2 = a^2 + b^2$$

$$c^2 = 12^2 + 18^2$$

$$c^2 = 144 + 324$$

$$\sqrt{c^2} = \sqrt{468}$$

$$c = \sqrt{468}$$

$3\sqrt{52} = \sqrt{468}$ because the similar Δ 's has a ratio 3 to 1.

$$(b) \quad \sqrt{468} = \sqrt{3 \times 52}$$
$$\sqrt{468} = \sqrt{52 \times 3 \times 3}$$
$$\sqrt{468} = \sqrt{468}$$

16. LCM

$$8 \rightarrow 2 \times 2 \times 2 = 2^3$$
$$14 \rightarrow 2 \times 7 = 2^1 \times 7^1$$

$$2^3 \times 7^1$$
$$8 \times 7 = \underline{\underline{56 \text{ days}}}$$