

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)  $\sqrt[5]{8000}$   
 $= \sqrt[4]{2 \times 2 \times 2 \times 2}$        $= \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2 \times 2}$        $= \sqrt[5]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}$   
 $= 2$        $= 2 \times 2$        $= 2 \times 2 \times 2 \times 2$   
 $= 4$        $= 20$

(d)  $\sqrt[4]{4096}$   
 $\sqrt[4]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}$   
 $2 \times 2 \times 2$   
 $= 8$

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)  $36 \rightarrow (2) \times (2) \times (3) \times 3$   
 $48 \rightarrow (2) \times (2) \times (2) \times (2) \times 3$   
 $72 \rightarrow (2) \times (2) \times (2) \times (3) \times 3.$

$$2 \times 2 \times 3$$

$$= 12$$

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

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

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

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

$V = l \times w \times h$

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

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

$2 \times 3 \times 7$   
 $= 42.$

•  $SA = 6(L \times w)$   
 $= 6(42 \times 42)$   
 $= 10584$



9.  $SA = \cancel{L} (L \times W)$   
↑ ↑ same  

$$\begin{array}{r} 5400 \\ \div 6 \\ \hline = 900 \end{array}$$

$$\sqrt{900}$$


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

$$2 \times 3 \times 5$$

$$= 30$$

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

50

10.

$$48 \rightarrow (2 \times 2 \times 2 \times 2 \times 3)$$

$$60 \rightarrow (2 \times 2 \times 3 \times 5)$$

$$84 \rightarrow (2 \times 2 \times 3 \times 7)$$

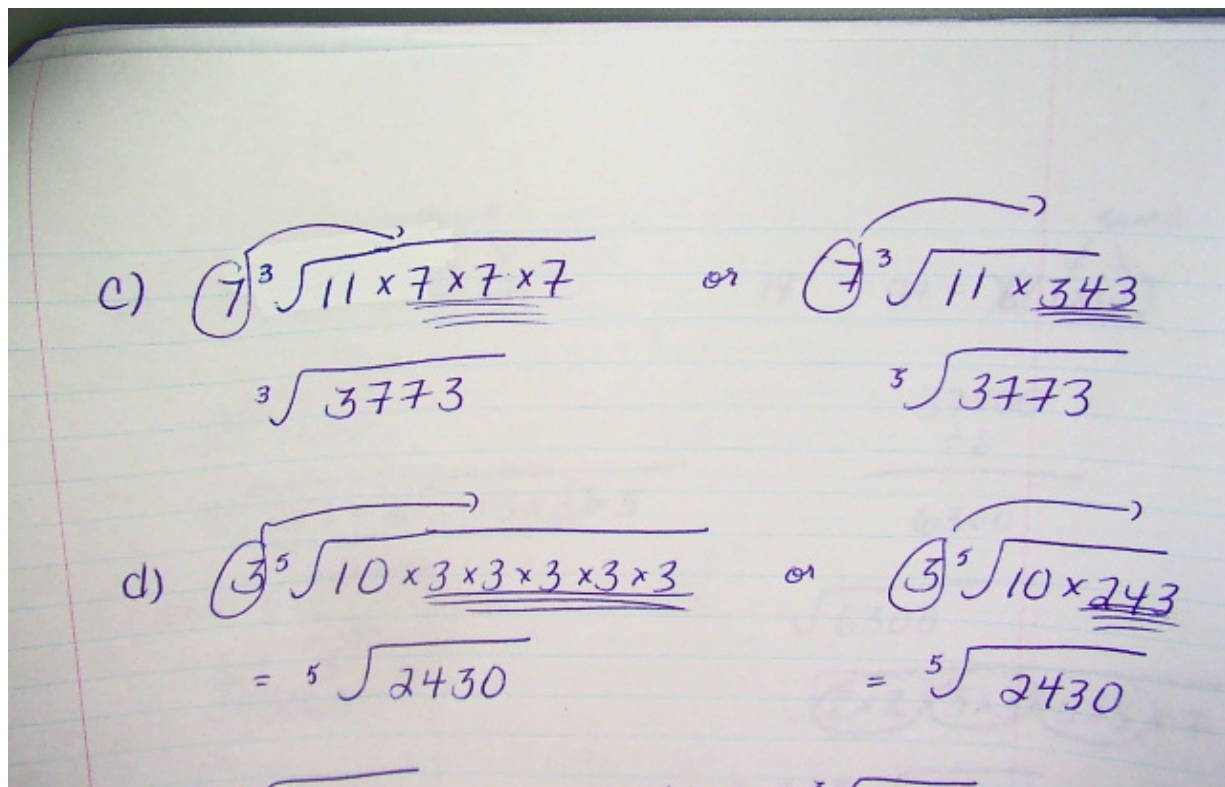
GCF:  $2 \times 2 \times 3$   
 $= \underline{\underline{12}}$

12 Bags

11.

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

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



12. a)  ${}^4\sqrt{243}$   
 ${}^4\sqrt{3 \times 3 \times 3 \times 3 \times 3}$   
 $= 3 {}^4\sqrt{3}$

b)  $5 {}^5\sqrt{48}$   
 $5 {}^5\sqrt{2 \times 2 \times 2 \times 2 \times 3}$   
 $= 10 {}^5\sqrt{6}$

c)  ${}^3\sqrt{1080}$   
 ${}^3\sqrt{2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5}$   
 $2 \times 3 {}^3\sqrt{5}$   
 $6 {}^3\sqrt{5}$

d)  $5 {}^5\sqrt{2592}$   
 $5 {}^5\sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3}$   
 $2 {}^5\sqrt{81}$

${}^3\sqrt{54} = \sqrt[3]{54}$  because the similar to this a ratio 3:1



13.  $V = l \times w \times h$  same.  
↙ ↓ ↘

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

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

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

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

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

$$\frac{37800}{\div 6}$$

$$6300$$

$$\sqrt{6300}$$

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

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

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

15.

RSQ

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

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

$$c^2 = 16 + 36$$

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

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

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  $\Delta$ '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

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

$$2^3 \times 7^1$$

$$8 \times 7 = \underline{\underline{56 \text{ days}}}$$