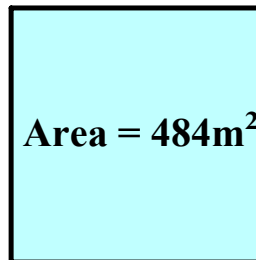## Warm Up Questions

1. Determine the *Greatest Common Factor* of 220 & 860.

2. Determine the *Least Common Multiple* of 60 & 230.

3. Determine the side length of the square.

Area = 484m^2

4. A cube has a volume of 2744cm^3. What is the surface area?

5. A cube has a surface area of 864 m^2. What is the volume.

6. $\sqrt[4]{1296}$

1.　Determine the *Greatest Common Factor* of 220 & 860.

220　➡　$2 \times 2 \times 5 \times 11$

860　➡　$2 \times 2 \times 5 \times 43$

GCF $= 2 \times 2 \times 5$

GCF $= 20$

2. Determine the *Least Common Multiple* of 60 & 230.

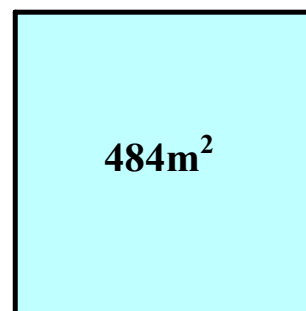$60 \rightarrow 2 \cdot 2 \cdot 3 \cdot 5 \quad = \quad 2^2 \cdot 3 \cdot 5$

$230 \rightarrow 2 \cdot 5 \cdot 23 \quad = \quad 2 \cdot 5 \cdot 23$

$$\text{LCM} = 2^2 \cdot 3 \cdot 5 \cdot 23$$

$$= 4 \cdot 3 \cdot 5 \cdot 23$$

$$= 1380$$

3. **Determine the side length of the square.**

$$\sqrt{484} = \sqrt{2 \cdot 2 \cdot 11 \cdot 11}$$

$$= 2 \cdot 11$$

$$= 22$$

484m^2

4. A cube has a volume of 2744cm^3. What is the surface area?

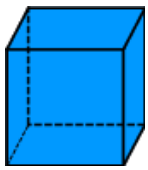$$\sqrt[3]{2744} = \sqrt[3]{2 \cdot 2 \cdot 2 \cdot 7 \cdot 7 \cdot 7}$$
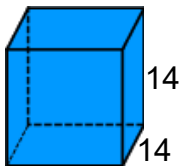
$$= 2 \cdot 7$$

$$= 14 \text{ cm} \quad \text{is the length}$$
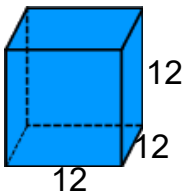
$$SA = 6(l \times w)$$
$$= 6 l^2$$
$$= 6 (14)(14)$$
$$= 1176 \text{ cm}^2$$

5. A cube has a surface area of 864 m². What is the volume.

$$\frac{864}{6} = 144 \text{ m}^2 \text{ (Area)}$$

144

$$\sqrt{144} = \sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3}$$

$$= 2 \cdot 2 \cdot 3$$

$$= 12 \text{ m (length)}$$

12
12
12

$$V = l \times w \times h$$

$$V = 12 \times 12 \times 12$$

$$V = 1728 \text{ m}^3$$

6. $\sqrt[4]{1296}$ $= \sqrt[4]{2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 3}$

$= 2 \cdot 3$

$= 6$

1. a) $848\ 925 \rightarrow 3 \times 3 \times 5 \times 5 \times 7 \times 7 \times 7 \times 11$

b) $7007 \rightarrow 7 \times 7 \times 11 \times 13$

2. a) $52 = 2 \times 2 \times 13$

$130 = 2 \times 5 \times 13$

$182 = 2 \times 7 \times 13$

$GCF = 2 \times 13$

$\quad\ = 26$

b) $66 = 2 \times 3 \times 11$

$165 = 3 \times 5 \times 11$

$321 = 3 \times 107$

$GCF = 3$

3. a) $\quad 3528 \quad = 2 \times 2 \times 2 \times 3 \times 3 \times 7 \times 7 = 2^3 \times 3^2 \times 7^2$

$37044 = 2 \times 2 \times 3 \times 3 \times 3 \times 7 \times 7 \times 7 =$

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

$\begin{aligned} LCM &= 2^3 \times 3^3 \times 7^3 \\ &= 8 \times 27 \times 343 \\ &= 74088 \end{aligned}$

3 b)

$75625 = 5 \times 5 \times 5 \times 5 \times 11 \times 11 \qquad = 5^4 \times 11^2$

$190575 = 5 \times 5 \times 3 \times 3 \times 7 \times 11 \times 11 = 3^2 \times 5^2 \times 7 \times 11^2$

$136125 = 3 \times 3 \times 5 \times 5 \times 5 \times 11 \times 11 = 3^2 \times 5^3 \times 11^2$

$LCM = \quad 3^2 \times 5^4 \times 7 \times 11^2$

$9 \times 625 \times 7 \times 121$

$4\ 764\ 375$

4. a) $1000 = 2 \times 2 \times 2 \times 5 \times 5 \times 5 \qquad$ Perfect Cube

hange→ b) $729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \qquad$ Perfect Square and Cube
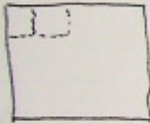
c) $1715 = 5 \times 7 \times 7 \times 7 \qquad$ Neither

hange→ d) $11025 = \underline{3 \times 3} \times \underline{5 \times 5} \times \underline{7 \times 7} \qquad$ Perfect Square.

4. a) $1000 = 2 \times 2 \times 2 \times 5 \times 5 \times 5$ Perfect Cube

hange → b) $729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3$ Perfect Square and Cube

c) $1715 = 5 \times 7 \times 7 \times 7$ Neither

hange → d) $11025 = 3 \times 3 \times 5 \times 5 \times 7 \times 7$ Perfect Square.

5.

1820m

2912 m

$1820 = 2 \times 2 \times 5 \times 7 \times 13$
$2912 = 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 13$

$GCF = 2 \times 2 \times 7 \times 13$
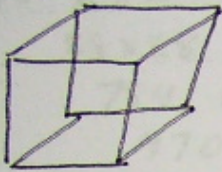$\quad\quad = 364$

6.

$$365 = 5 \times 73 \qquad = 5 \times 73$$
$$260 = 2 \times 2 \times 5 \times 13 \quad = 2^2 \times 5 \times 13$$

$$LCM = 2^2 \times 5 \times 13 \times 73$$

$$= 4 \times 5 \times 13 \times 73$$

$$= 18\,980$$

How Long in years?

$$\frac{18\,980}{365} = 52 \text{ years.}$$

7.

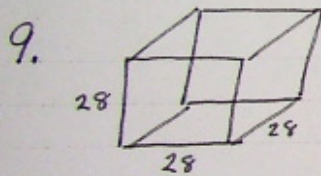$SA = \dfrac{6534}{6 \text{ sides}}$

$= 1089$ (Area of each side)

$\sqrt{1089} = 3 \times 3 \times 11 \times 11$

$= 3 \times 11$

33

Volume $\rightarrow$ L x W x H

33 x 33 x 33

35937

8. $40 = 2 \times 2 \times 2 \times 5 \quad = \quad 2^3 \times 5$

    $90 = 2 \times 3 \times 3 \times 5 \quad = \quad 2 \times 3^2 \times 5$

    $LCM = \quad 2^3 \quad \times \quad 3^2 \quad \times \quad 5$

    $ \quad 8 \quad \times \quad 9 \quad \times \quad 5$

    $ \quad 360$

9.

    28   28   28

    $V = 21952$

    $\sqrt[3]{21952} = \boxed{2 \times 2 \times 2} \boxed{2 \times 2 \times 2} \boxed{7 \times 7}$

    $2 \times 2 \times 7$

    28

    $SA = L \times W$

    28×28

    784×6

    4704

10. Surface Area

$$\frac{13824}{6} = 2304 \, m^2$$

$$\sqrt{2304} = \overline{(2 \times 2)} \times \overline{(2 \times 2)} \times \overline{(2 \times 2)} \times \overline{(2 \times 2)} \times \overline{(3 \times 3)}$$

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

$$= 48 \, m \quad edge \ length$$

$$Volume = 48 \times 48 \times 48$$

$$= 110592 \, m^3$$

11. Surface Area

$$\frac{1536}{6} = 256 \, m$$

$$\sqrt{256} = (2 \times 2) \times (2 \times 2) \times (2 \times 2) \times (2 \times 2)$$

$$2 \times 2 \times 2 \times 2$$

$$= 16 \, m \quad \text{edge length}$$

Volume $= 16 \times 16 \times 16$

$$= 4096 \, m^3$$

12. Surface Area $= 1176 m^2$

$$\frac{1176}{6} = 196$$

$$\sqrt{196} = (2 \times 2) \times (7 \times 7)$$

$$= 14_m \text{ edge length}$$

13. Volume = 1728 cm^3

$\sqrt[3]{1728}$ = $(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (3 \times$

= $2 \times 2 \times 3$

= 12 cm edge length

14. Volume $= 10648 \ m^3$

$\sqrt[3]{10648}$ $= \overline{(2 \times 2 \times 2)} \times \overline{(11 \times 11 \times 11)}$

$= 2 \times 11$

$= 22 \ m$

Surface Area $=$ $A = L \times W$

22×22

$484 \ m^2$

$\times 6$

$\overline{2904 \ m}$

15. Surface Area $= 1944\,m^2$

$$\frac{1944}{6} = 324\,m$$

$$\sqrt{324} = \boxed{2 \times 2} \times \boxed{3 \times 3} \boxed{\times 3 \times 3}$$

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

$$= 18\,m$$

Volume $= 18 \times 18 \times 18$
$$= 5832\,m^3$$

16.

a) $3375 \rightarrow$ (3 × 3 × 3)(5 × 5 × 5)   Perfect Cube

b) $676 \rightarrow$ (2 × 2)(13 × 13)   Perfect Square

c) $1089 \rightarrow$ (11 × 11)(3 × 3)   Perfect Square.

d) $13824 \rightarrow$ (2 × 2 × 2)(2 × 2 × 2)(2 × 2 × 2)(3 × 3 × 3)

Perfect Cube.