Shelf/Box Questions

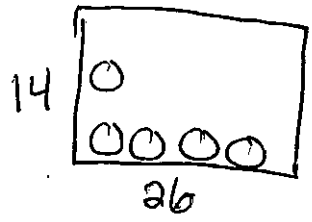
-Draw a two dimensional diagram of the shelf/bottom of the box

-Find how many of each object with fit in each dimension by dividing the dimension by the diameter/width of the object and sketch that into the diagram

*For boxes, add in the third dimension

-Multiply the amount in each dimension by each other to come up with the total number.

1. Boxes of baseball cards are being put on a display shelf. Each box is a cube with edge length of 6 inches. The display shelf is 26 inches by 14 inches. The boxes must completely fit on the shelf and cannot be stacked on top of each other. What is the maximum number of boxes that can fit on the shelf?

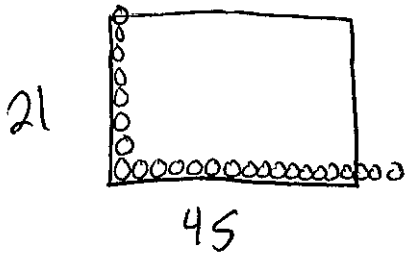


4×2=8

$\frac{26}{6} = 4.\overline{3} = 4$

$\frac{14}{6} = 2.\overline{3} = 2$

2. Cylindrical soup cans with a base diameter of 2.5 inches and a height of 4 inches are to be put on a display shelf. The display shelf measures 21 inches by 45 inches. The cans must completely fit on the shelf and cannot be stacked on top of each other. What is the maximum number of cans that can fit on the shelf?

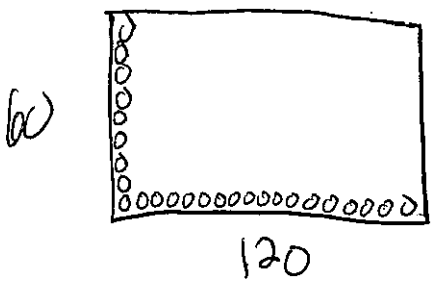


18×8=144

$\frac{21}{2.5} = 8.4 = 8$

$\frac{45}{2.5} = 18$

3. Lacrosse balls have a diameter of 6.47 centimeters and are to be put on a shelf that measures 120 centimeters by 60 centimeters. The balls must completely fit on the shelf and cannot be stacked on top of each other. What is the maximum number of balls that can fit on the shelf?

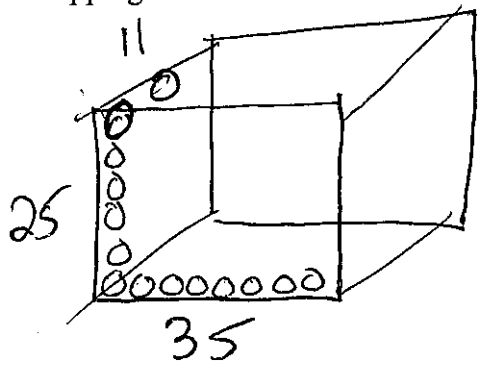


18×9=162

$\frac{60}{6.47}$ 9.27 → 9

$\frac{120}{6.47}$ 18.5 → 18

4. Funko Pops come in cubic packages with edge length of 4 inches. They are to be packed into a shipping box that is a rectangular prism that measures 35 inches by 25 inches by 11 inches. What are the maximum number of Funko Pops that can fit into the shipping box?



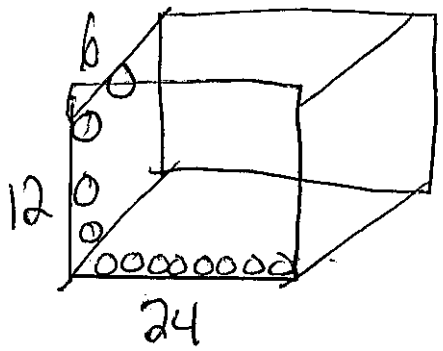
$8 \times 6 \times 2 = 96$

$\frac{35}{4}$ $\frac{25}{4}$ $\frac{11}{4}$

8.75 6.25 2.75

8 6 2

5. Baseballs that have a diameter of 2.8 inches are to be packed into a rectangular shipping box that has dimensions 24 inches by 12 inches by 6 inches. What is the maximum number of baseballs that can fit into the shipping box?



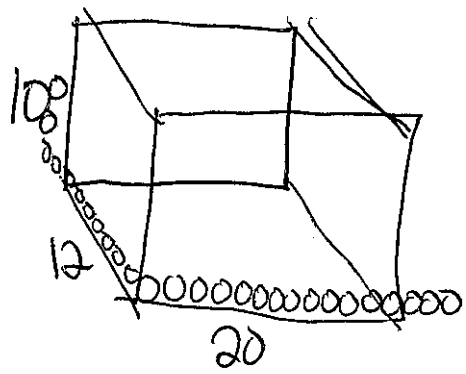
$\frac{24}{2.8}$ $\frac{12}{2.8}$ $\frac{6}{2.8}$

8.57... 4.28... 2.14...

8 4 2

$8 \times 4 \times 2 = 64$

6. Ice cream cones are to be packed into a shipping box that has a base that measures 20 inches by 12 inches and has a height of 10 inches. The cones have a diameter of 1.2 inches and a height of 3.2 inches. How many cones can be packed into the box?



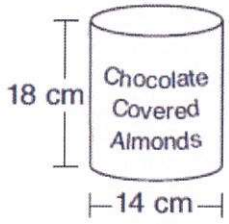
$\frac{20}{1.2}$ $\frac{12}{1.2}$ $\frac{10}{3.2}$

16.6... 10 3.125

16 10 3

$16 \times 10 \times 3 = 480$

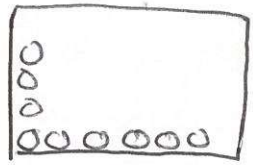
7. A manufacturer is designing a new container for their chocolate-covered almonds. Their original container was a cylinder with a height of 18 cm and a diameter of 14 cm. The new container can be modeled by a rectangular prism with a square base and will contain the same amount of chocolate-covered almonds. Same Volume
If the new container's height is 16 cm, determine and state, to the *nearest tenth of a centimeter*, the side length of the new container if both containers contain the same amount of almonds. A store owner who sells the chocolate-covered almonds displays them on a shelf whose dimensions are 80 cm long and 60 cm wide. The shelf can only hold one layer of new containers when each new container sits on its square base. Determine and state the maximum number of new containers the store owner can fit on the shelf.



$V = \pi r^2 h$
$V = \pi(7)^2(18)$
$V = 2770.\ cm^3$

$V = lwh$
$2770. = x(x)(16)$
$\frac{2770.}{16} = \frac{16x^2}{16}$
$\sqrt{173..} = \sqrt{x^2}$
$13.2 = x$

$\frac{80}{13.2}$ $\frac{60}{13.2}$
$6.06..$ $4.54..$
6 4



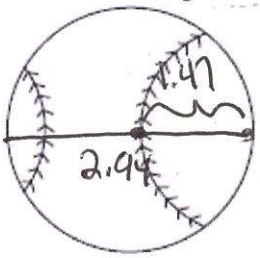
$6 \times 4 = 24$

8. A packing box for baseballs is the shape of a rectangular prism with dimensions of 2 ft × 1 ft × 18 in. Each baseball has a diameter of 2.94 inches.
Determine and state the maximum number of baseballs that can be packed in the box if they are stacked in layers and each layer contains an equal number of baseballs. The weight of a baseball is approximately 0.025 pound per cubic inch. Determine and state, to the *nearest pound*, the total weight of all the baseballs in the fully packed box.

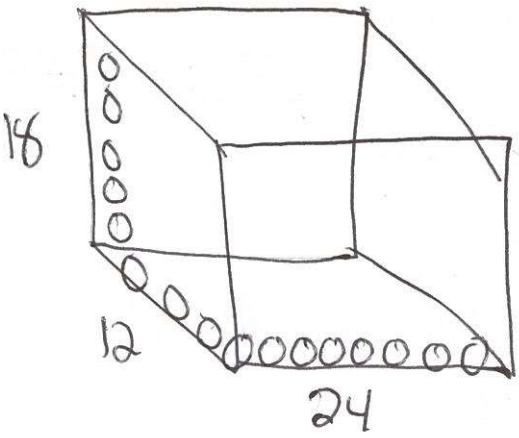
24 in
$2\text{ft} \times \frac{12\text{in}}{1\text{ft}}$

$1\text{ft} \cdot \frac{12\text{in}}{1\text{ft}}$

12 in



$\frac{24}{2.94}$ $\frac{12}{2.94}$ $\frac{18}{2.94}$
$8.16..$ $4.08..$ $6.12.$
8 4 6



$8 \times 4 \times 6 =$ 192 baseballs

$V = \frac{4}{3}\pi r^3$
$V = \frac{4}{3}\pi(1.47)^3$
$V = 13.3..\ in^3$

$13.3..\ in^3 \cdot \frac{.025\text{lb}}{in^3} \times 192$

64 pounds