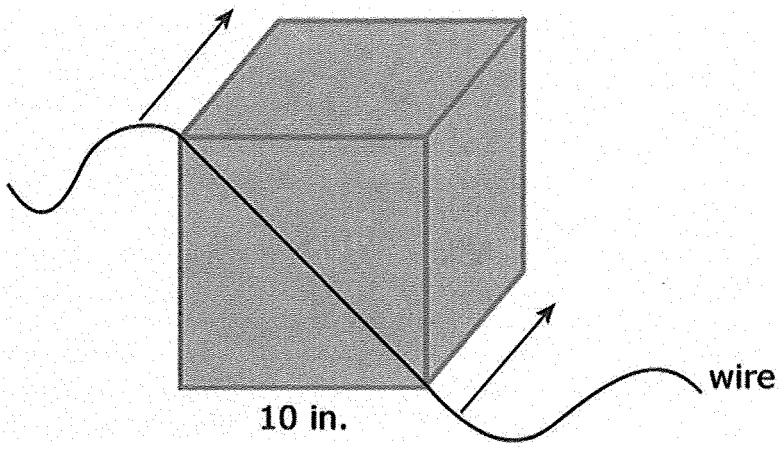
# Volume Task

**Part A**

Daniel buys a block of clay for an art project. The block is shaped like a cube with edge lengths of 10 inches.

Daniel decides to cut the block of clay into two pieces. He places a wire across the diagonal of one face of the cube, as shown in the figure. Then he pulls the wire straight back to create two congruent chunks of clay.




Daniel wants to keep one chunk of the clay for later use. To keep that chunk from drying out, he wants to place a piece of plastic sheeting on the surface he exposed when he cut through the cube. Describe this newly exposed two-dimensional cross section, and find its area. Round your answer to the nearest whole square inch. Show your work.

**Part B**

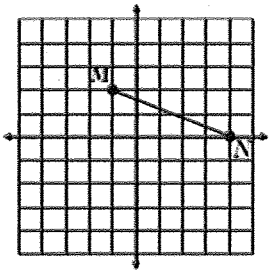
Daniel wants to reshape the other chunk of clay to make a set of clay spheres. He wants each sphere to have a diameter of 4 inches. Find the maximum number of spheres that Daniel can make from the chunk of clay. Show your work.

**Year End Review**
**Distance and Midpoint Formula / Line and Angle Relationships**

1) Given the points below, find $XY$. Round to the nearest hundredth.

$X(-9, 2)$ and $Y(5, -4)$

2) Given the graph below, find $MN$. Round to the nearest hundredth.



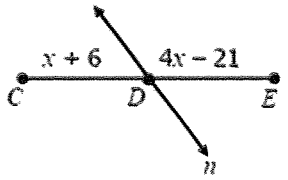

3) Find the midpoint of $\overline{AB}$ if $A(-3, 8)$ and $B(-7, -6)$.

4) If $Q$ is the midpoint of $\overline{PR}$, find the coordinates of $R$ if $P(11, -2)$ and $Q(4, 3)$.

5) If $K$ is the midpoint of $\overline{JL}$, $JK = 8x + 11$ and $KL = 14x - 1$, find $JL$.

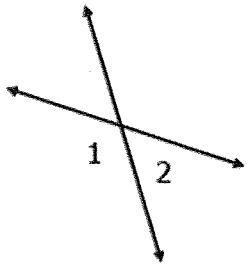
$JL =$

6) If line $n$ bisects $\overline{CE}$, find $CD$.



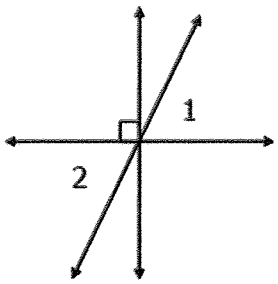

$CD =$

7) Classify $\angle 1$ and $\angle 2$ using all relationships that apply.



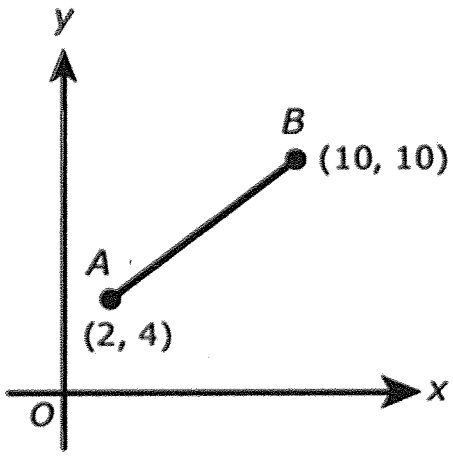

- ☐ Adjacent
- ☐ Vertical
- ☐ Complementary
- ☐ Supplementary
- ☐ Linear Pair

8) Classify $\angle 1$ and $\angle 2$ using all relationships that apply.




- ☐ Adjacent
- ☐ Vertical
- ☐ Complementary
- ☐ Supplementary
- ☐ Linear Pair

9) In the coordinate plane shown, point $C$ (not shown) lies on $\overline{AB}$.

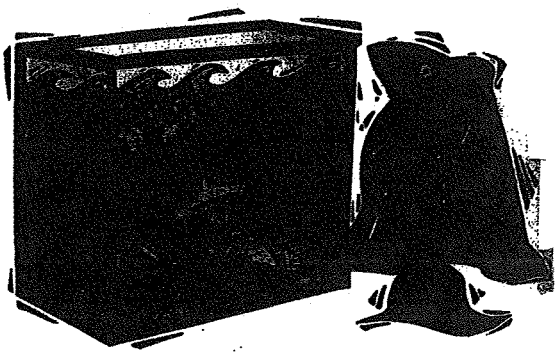



If the ratio of the length of $\overline{AC}$ to the length of $\overline{CB}$ is 3:1, what is the $y$-coordinate of point $C$ ? You MUST show or explain how you got your answer!

**Do these problems on your own sheet of paper! Show all of your work for credit.**

1. When you put a rock into a container of water, it raises the water level 3 cm. If the container is a rectangular prism whose base measures 15 cm by 15 cm, what is the volume of the rock?

2. You drop a solid glass ball into a cylinder with a radius of 6 cm, raising the water level 1 cm. What is the volume of the glass ball?



3. A fish tank 10 by 14 by 12 inches high is the home of a large goldfish named Columbia. She is taken out when her owner cleans the tank, and the water level in the tank drops $\frac{1}{3}$ inch. What is Columbia's volume?

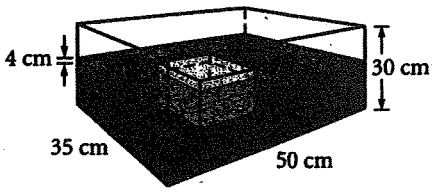
4. What is the mass of a solid block of aluminum if its dimensions are 4 cm by 8 cm by 20 cm?

5. Which has more mass: a solid cylinder of gold with a height of 5 cm and a diameter of 6 cm or a solid cone of platinum with a height of 21 cm and a diameter of 8 cm?

6. Chemist Dean Dalton is given a clump of metal and is told that it is sodium. He finds that the metal has mass 145.5 g. He places it into a nonreactive liquid in a square prism whose base measures 10 cm on each edge. If the metal is indeed sodium, how high should the liquid level rise?

7. A square-prism container with a base 5 cm by 5 cm is partially filled with water. You drop a clump of metal with mass 525 g into the container, and the water level rises 2 cm. What is the density of the metal? Assuming the metal is pure, what is the metal?

8. When ice floats in water, one-eighth of its volume floats above the water level and seven-eighths floats beneath the water level. A block of ice placed into an ice chest causes the water in the chest to rise 4 cm. The right rectangular chest measures 35 cm by 50 cm by 30 cm high. What is the volume of the block of ice?




| Metal | Density | Metal | Density |
|---|---|---|---|
| Aluminum | 2.81 g/cm$^3$ | Nickel | 8.89 g/cm$^3$ |
| Copper | 8.97 g/cm$^3$ | Platinum | 21.40 g/cm$^3$ |
| Gold | 19.30 g/cm$^3$ | Potassium | 0.86 g/cm$^3$ |
| Lead | 11.30 g/cm$^3$ | Silver | 10.50 g/cm$^3$ |
| Lithium | 0.54 g/cm$^3$ | Sodium | 0.97 g/cm$^3$ |