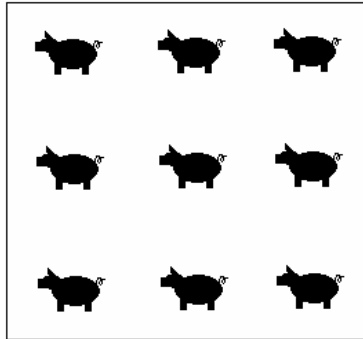


SOML MEET
EVENT 1
APPLICATIONS OF GEOMETRY

NAME: _____
TEAM: _____
SCHOOL: _____

1. [2 Points] Nine pigs live in the square pen shown below. Draw exactly two squares in such a way that each pig will have its own pen.



2. [3 Points] A person is planning on building a cubical house made entirely out of glass. The house has a fixed length of 3 units. Neglecting doors, (which will be added later) how many square units of glass does this person need if they are planning on 27 identical cubical rooms which will fill the entire volume of the house? You may assume the glass is very thin.

ANS: _____

3. [5 Points] Bobby has two cylindrical tin cans of fruit. The label on the small can indicates that its volume is 720 ml. The label is missing from the larger can. Bobby measures the two cans and finds that the diameter of the large can is $1\frac{1}{2}$ times the diameter of the smaller can and the height of the larger can is $1\frac{1}{3}$ times the height of the smaller can. What is the volume of the larger can? Give your answer in ml.

ANS: _____ ml

**SOML MEET
EVENT 1
KEY**

NAME: _____
TEAM: _____
SCHOOL: _____

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Solution: Each side of the house consists of 9 square units. Four panels are required for each of the three dimensions to build the house. So the number of square units of glass required is $9 \times 12 = 108$ square units.

ANS: 108 square units

3. [5 Points] Bobby has two cylindrical tin cans of fruit. The label on the small can indicates that its volume is 720 ml. The label is missing from the larger can. Bobby measures the two cans and finds that the diameter of the large can is $1\frac{1}{2}$ times the diameter of the smaller can and the height of the larger can is $1\frac{1}{3}$ times the height of the smaller can. What is the volume of the larger can? Give your answer in ml.

$$\begin{aligned}V_{small} &= \pi r^2 h = 720 \\V_{large} &= \pi R^2 H \\&= \pi \left(\frac{3}{2}r\right)^2 \left(\frac{4}{3}h\right) \\&= \pi \left(\frac{3}{2}\right)^2 \left(\frac{4}{3}\right)r^2 h \\&= \left(\frac{3}{2}\right)^2 \left(\frac{4}{3}\right)(720) \\&= (3)(720) \\&= 2160\end{aligned}$$

ANS: 2160 ml