Triangles


## Gnomes



Forty Nine Gnomes start out on the above dots, initially seven on each dot.
Each gnome hops clockwise along the dots, once per minute.
The gnomes can hop more than one dot when they hop, though - for example, some gnomes may skip over three dots when they jump. In fact, each gnome picks a number from 0 to 6, and hops that many dots each minute.
So, a gnome that picks 0 hops nowhere and stays on their first dot,
A gnome that picks 1 will hop one dot clockwise every minute,
A gnome that picks 2 will hop forward to the second dot in the clockwise direction every minute,
A gnome that picks 3 will hop forward to the third dot in the clockwise direction every minute,
etc.
Now, you want to capture the gnomes.
Each minute, you can jump onto one of the dots and capture all the gnomes currently on that dot.
You can pick any dot you want, but you can only pick one per minute.
What's the shortest time, in minutes, that you would need to capture all the gnomes?

| Ones Digitit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | $0^{\text {Tens }} 0$

## Hexagon?

In the xyz-coordinate space, define the following sets:
$A=\{(x, y, z) \mid x=y\}$ - this is the set of all points whose $x$-coordinate equals its $y$-coordinate
$B=\{(x, y, z) \mid y=z\}$
$C=\{(x, y, z) \mid z=x\}$
$M=\{(x, y, z) \mid x+y+z=0\}$
$S=\left\{(x, y, z) \mid x \wedge 2+y^{\wedge} 2+z^{\wedge} 2=2\right\}$

$$
\text { Let } X=(A \cap M \cap S) U(B \cap M \cap S) U(C \cap M \cap S)
$$

Determine the area of $X$ as a simplified number of the form a*sqrt(b)

| $a b$ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 |  |  |  |  |  |  |  |  |  |  |
| 1 |  | get | give | sleep |  | find | have | eat |  |  |
| 2 |  | is | eat | give |  | find | sleep | have |  |  |
| 3 |  | sleep | get | have |  | eat | give | is |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |  |  |  |

## Seasons



Nature - - Autumn
Nature | - | - Windy
Nature | - - - - Spring
Nature - - | - - Winter
Nature - 1 - - 1 - Windy
Nature - - - 1 - Spring
Nature | - - 1 - Nature
Nature- $\mid$ - $\mid$ - - - - Nature
Rainy $\mid$ - - - $\mid$ ?

## Fill in the blanks for the final answer



