MTH1W Activity

Modeling Linear Relationships

Warm-Up

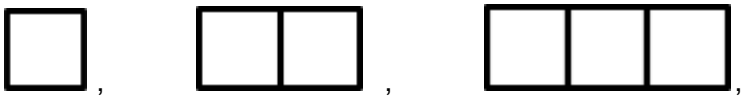
1. Fill in the next three numbers in each pattern.

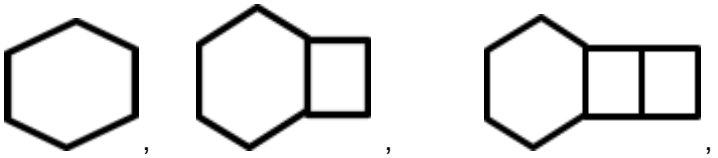
a) 2, 5, 8, ___, ___, _____

b) -10, -15, -20, ___, ___, ___

c) $\frac{1}{2}$, 1, $\frac{3}{2}$, ___, ___, ___

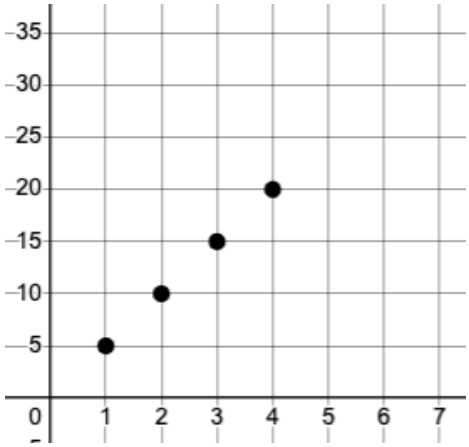
2. Draw the next member of each pattern.

a) 

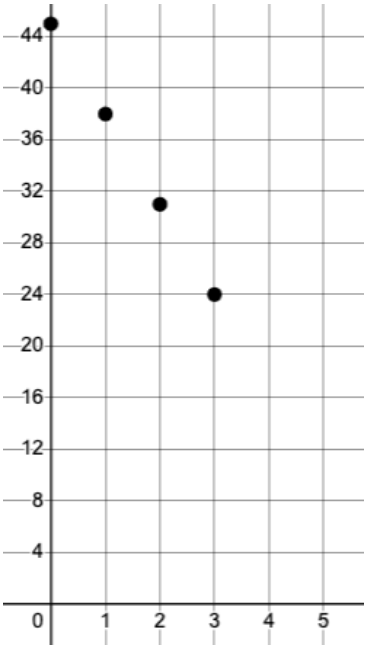
b) 

3. Graph the next two points on each graph.

a)



b)



Activity 1

1. Create this pattern with toothpicks, and then extend it for **two more** stages.

Triangles	Pattern	Number of Toothpicks
1		3
2		6
3		
4		
5		

2. Explain this pattern in words:

One triangle requires _____ toothpicks.
For every extra triangle, _____ toothpicks are added.

3. Let *T* be the number of toothpicks.
Let *x* be the number of triangles.

Write an equation to calculate *y* from *x*.

4. How many toothpicks would be required to make 20 triangles?

Activity 2

1. Create this pattern with toothpicks, and then extend it for **two more** stages.

Triangles	Pattern	Number of Toothpicks
1		
2		
3		
4		
5		

2. Explain this pattern in words:

One triangle requires _____ toothpicks.
For every extra triangle, _____ toothpicks are added.

3. Let *T* be the number of toothpicks.
Let *x* be the number of triangles.

Write an equation to calculate *y* from *x*.

4. How many toothpicks would be required to make 20 triangles?

Activity 3

1. CREATE a pattern that contains the required number of toothpicks as shown.

_____	Pattern	Number of Toothpicks
1		4
2		9
3		14
4		19
5		24

2. Explain this pattern in words:

One __(shape)__ requires _____ toothpicks.
For every extra ___(shape)___, _____ toothpicks are added.

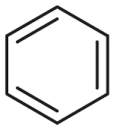
3. Let *T* be the number of toothpicks.
Let *x* be the number of _____.

Write an equation to calculate *y* from *x*.

4. How many toothpicks would be required to make 20 _____(shape)_____?

Activity 4

1. Draw simple versions of each of the following molecules (**use Google Image Search**)

Molecule	Pattern	Number of RIngs	Number of Toothpicks Required
Benzene		1	9
Naphthalene		2	
Anthracene		3	
Tetracene		4	
Pentacene		5	

3. Explain this pattern in words:

1 Ring requires with _____ toothpicks.

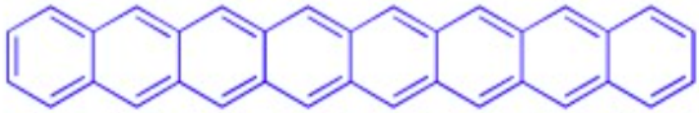
For every extra ring, _____ toothpicks are added.

4. Write an equation relating

Number of Rings (x)

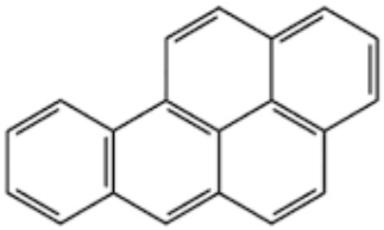
To number of toothpicks (y)

5. Does octacene (shown) follow this pattern?



How do you know?

6. Does benzo-[a]-pyrene (shown) follow this pattern?



How do you know?