

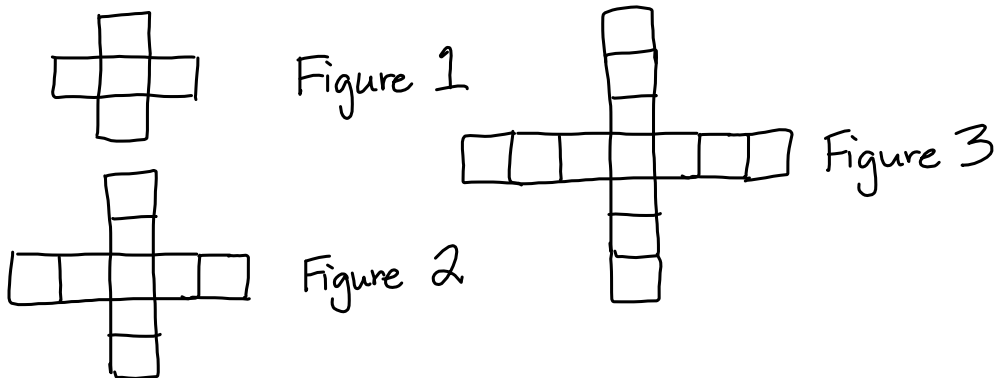
## Sec. 4.2 Patterns and Linear Functions

Vocabulary  $(7,2)$   $7 \rightarrow 2$   $(7,2)$   $7 < \frac{2}{3} \times$   
 $(8,2)$   $8 \rightarrow 2$   $(7,3)$

- dependent variable: changes in response to the independent variable; its value depends on the value of another variable
- independent variable: provides the input values of the function
- input: value of the independent variable
- output: value of the dependent variable
- \*function: each input has exactly one output
- linear function: a function whose graph is a nonvertical line or part of a nonvertical line

Problem 1:

What is the relationship between the figure number and the number of squares in the figure?



$x$ Figure #		$y$ # of Squares
1	$4(1) + 1$	5 > 4
2	$4(2) + 1$	9 > 4
3	$4(3) + 1$	13 > 4
$x$	$4(x) + 1$	$4x + 1$

$$y = 4x + 1$$

Problem 2:

The table shows the amount of water  $y$  in a tank after  $x$  minutes of being drained. Is the relationship a function? Describe the relationship using words and an equation.

Water in a Tank

Time, $x$ minutes	Water, $y$ (gallons)		
0	440	} -12	$-12(0) + 440$
1	428		$-12(1) + 440$
2	416	} -12	$-12(2) + 440$
3	404		$-12(3) + 440$
$x$			$-12(x) + 440$

The relationship is a function.

$$y = -12x + 440$$

The amount of water in gallons left in the tank is 440 minus 12 times the number of minutes