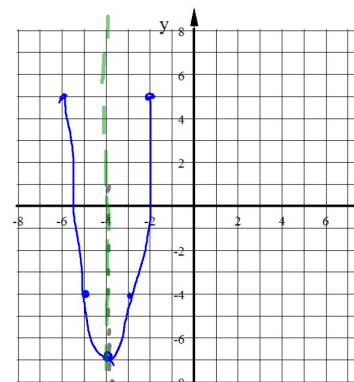## Panel 1 (top-left)

$y = -2(x - 1)^2 + 5$

What will this graph look like?
parabola opens down

What will the vertex be? **(1, 5)**

What numbers would you use in a table to find the rest of the graph?

x	y
2	3
3	-3

Panel 2 (top-right)

$y = 3(x + 4)^2 - 7$

4 Left → **7 down**

Vertex (-4, -7)

X	Y
-3	-4
-2	5

Once you know the vertex pick two x-values close to the vertex then use the Line of Symmetry to find the remaining two points.

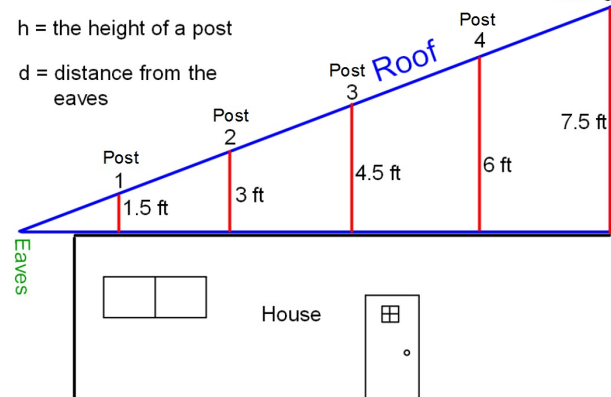Line of Symmetry (vertical through the vertex)

Panel 3 (bottom-left)

Section 5-5: Direct Variation

Panel 4 (bottom-right)

The posts are all 4 feet apart. Post 1 is 4 feet from the eaves.

h = the height of a post

d = distance from the eaves

Post 5

Post 4

Post 3

Post 2

Post 1

Roof

7.5 ft

6 ft

4.5 ft

3 ft

1.5 ft

Eaves

House

Find the ratio $\frac{h}{d}$ for each post.

POST	h	d	$\frac{h}{d}$
1	1.5	4	$\frac{1.5}{4} = .375$
2	3	8	$\frac{3}{8} = .375$
3	4.5	12	$\frac{4.5}{12} = .375$
4	6	16	$\frac{6}{16} = .375$
5	7.5	20	$\frac{7.5}{20} = .375$

This shows that

$\frac{h}{d}$ is a

Constant Ratio

Section 5-5: Direct Variation

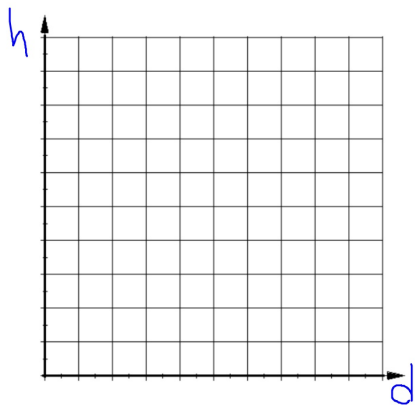Direct Variation is a special Linear Function.

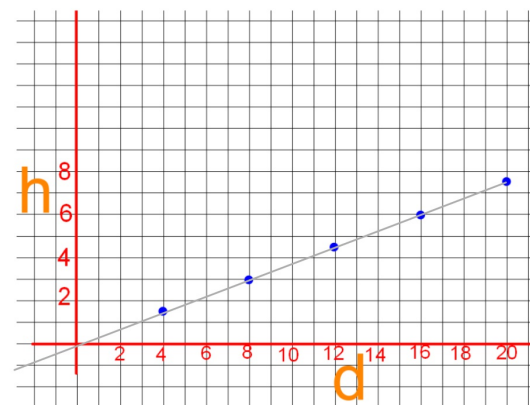- It has a constant ratio $\frac{Y}{X} = k$

  k = the Variation Constant

- Direct Variation Equation:

  $\frac{y}{x} = k$ or $y = kx$

Make a scatter plot of the data in the table.

h

d

h	d
1.5	4
3	8
4.5	12
6	16
7.5	20

---

h

d

This Direct variation would have the following equation?

$y = .375 X$

oR

$\frac{y}{x} = .375$

Graph of direct variation

- The graph must be a **line** that passes through **the origin.**

1.

X	Y	Y/X
6	28.5	4.75
11	52.25	4.75
19	89	4.60
26	119.6	
42	201.6	

Because the third ratio is not the same as the first this is NOT Direct Variation

2.

X	Y	Y/X
4	5.4	
14	18.9	
22	21.6	
27	36.45	
34	45.9	

Because the first two ratios will be larger than 1 and the third ratio will be less than 1 this relation is NOT Direct Variation
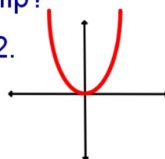

Does each graph represent a Direct Variation relationship?
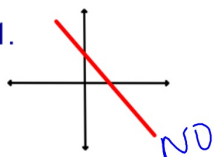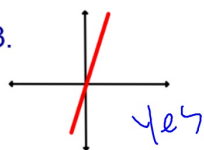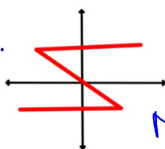
1. NO

2. NO

3. Yes

4. NO

The only graph that is BOTH a line and passes through the origin is graph #3. This is the only Direct Variation relation.