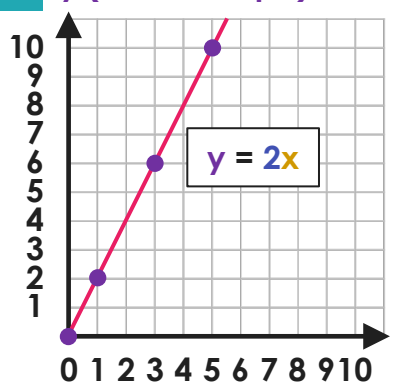
We will identify proportional relationships in graphs. | Concept Development

A **proportional relationship** can be written as an equation **y = kx**.

- When **x** changes, **y** changes by a **constant factor**.
- The **constant of proportionality (k)** or unit rate is a **constant factor**.
- The equation **y = kx** is a **straight line** through the **origin** (0, 0), since 0 = k(0).

Proportional Relationship

x ft	y $	Unit Rate (k) $/ft
0	0	
1	2	$\frac{2}{1} = 2$
3	6	$\frac{6}{3} = 2$
5	10	$\frac{10}{5} = 2$

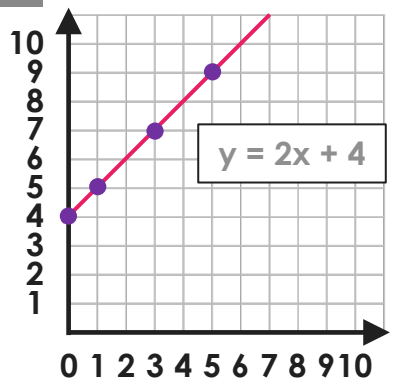


The cost of rope per foot is proportional to the length bought, which is **$2/ft**.

- **Straight line**
- Graph **goes through the origin**
- Unit rate is **constant**

Non-Proportional Relationship

x ft	y $	Unit Rate (k) $/ft
0	4	
1	5	$\frac{5}{1} = 5$
3	7	$\frac{7}{3} = 2.\overline{3}$
5	9	$\frac{9}{5} = 1.8$

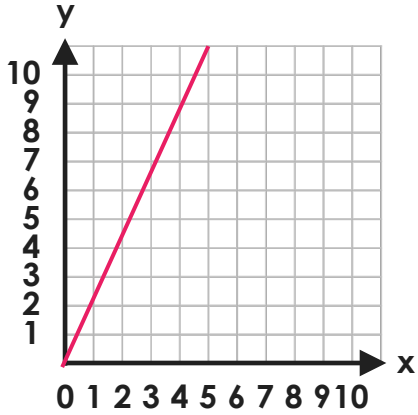


The cost of rope per foot is **not** proportional to the length bought.

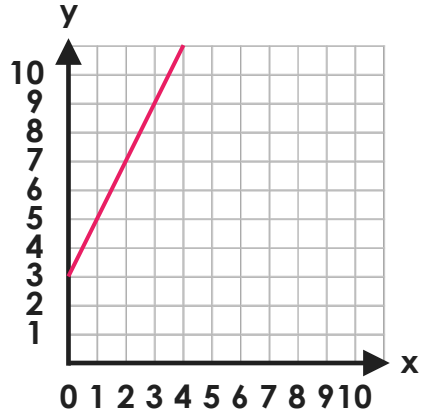
- Graph does **not go through the origin**
- Unit rate is **not** constant

CFU

Does this graph show a proportional relationship? Explain.



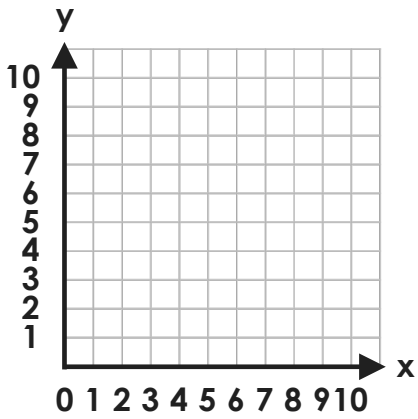
Does this graph show a proportional relationship? Explain.



1 Plot each ordered pair. (draw points)
2 Draw a line going through all the points.
3 Verify if the line goes through the origin. (check)
4 Determine if the graph shows a proportional relationship. (write)

1.

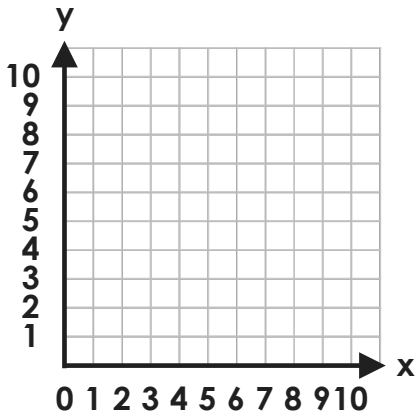
x	y
0	0
2	1
6	3
10	5



The graph (does/does not) _____ show a proportional relationship because…

2.

x	y
0	3
2	5
4	7
6	9

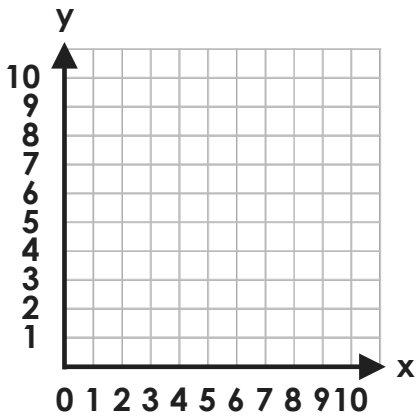


The graph (does/does not) _____ show a proportional relationship because…

1 Plot each ordered pair. (draw points)
2 Draw a line going through all the points.
3 Verify if the line goes through the origin. (check)
4 Determine if the graph shows a proportional relationship. (write)

3.

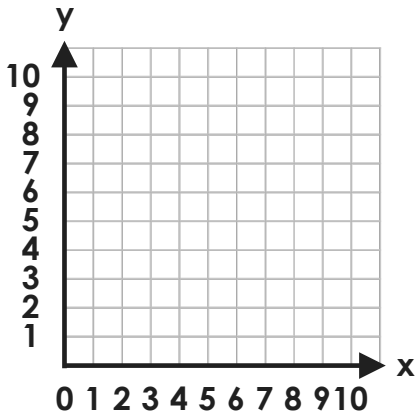
x	y
1	4
3	5
5	6
7	7



The graph (does/does not) _____ show a proportional relationship because…

4.

x	y
1	1
3	3
5	5
7	7



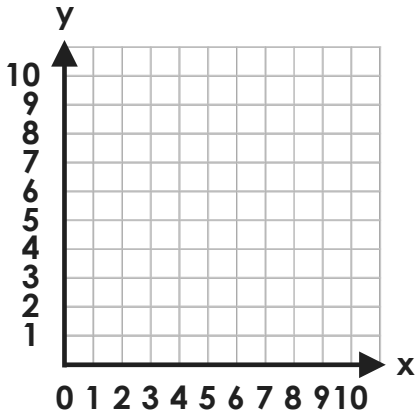
The graph (does/does not) _____ show a proportional relationship because…

Skill Closure

1 Plot each ordered pair. (draw points)
2 Draw a line going through all the points.
3 Verify if the line goes through the origin. (check)
4 Determine if the graph shows a proportional relationship. (write)

1.

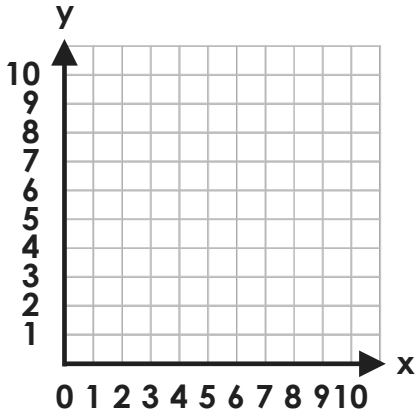
x	y
0	0
3	1
6	2
9	3



The graph (does/does not) _____ show a proportional relationship because…

2.

x	y
1	2
2	4
3	6
4	8

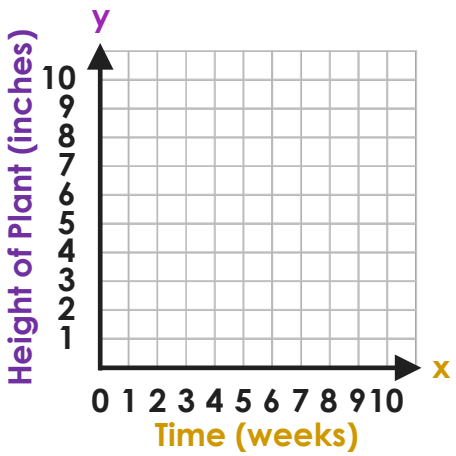


The graph (does/does not) _____ show a proportional relationship because…

Concept Closure

Read the problem and write your explanation.

Delilah wants to draw a proportional graph about a plant's height being 8 inches tall at 10 weeks. Explain how she should draw the graph.



Summary Closure

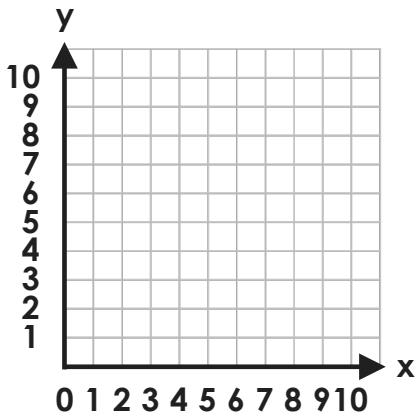
What did you learn today about identifying proportional relationships in graphs?

Word Bank
proportional relationship
non-proportional relationship
equivalent ratios
unit rate or constant of proportionality (k)
graphs

1 Plot each ordered pair. (draw points)
2 Draw a line going through all the points.
3 Verify if the line goes through the origin. (check)
4 Determine if the graph shows a proportional relationship. (write)

1.

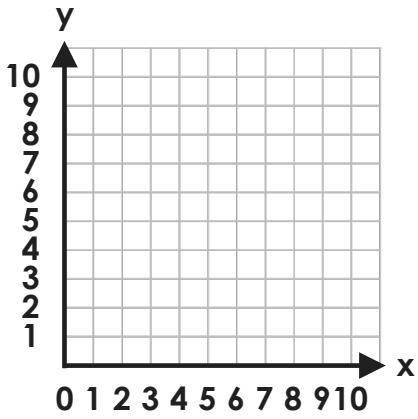
x	y
0	0
1	2
2	4
3	6



The graph (does/does not) _____ show a proportional relationship because…

2.

x	y
0	9
1	9
2	9
3	9

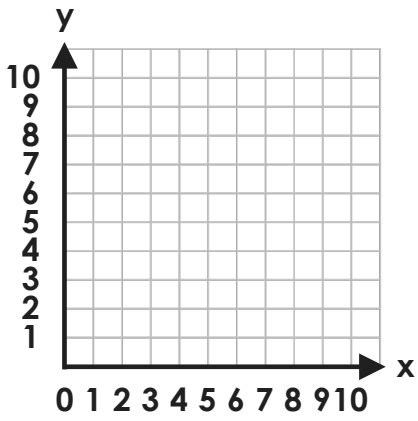


The graph (does/does not) _____ show a proportional relationship because…

1 Plot each ordered pair. (draw points)
2 Draw a line going through all the points.
3 Verify if the line goes through the origin. (check)
4 Determine if the graph shows a proportional relationship. (write)

3.

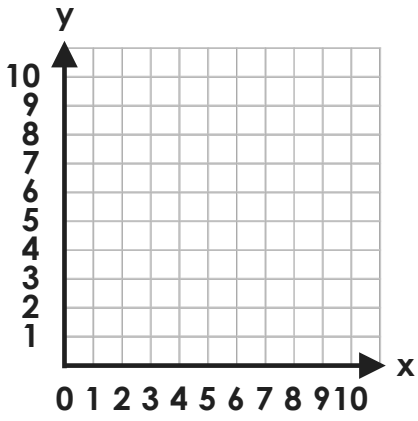
x	y
0	0
1	3
2	6
3	9



The graph (does/does not) _____ show a proportional relationship because…

4.

x	y
1	4
4	3
7	2
10	1

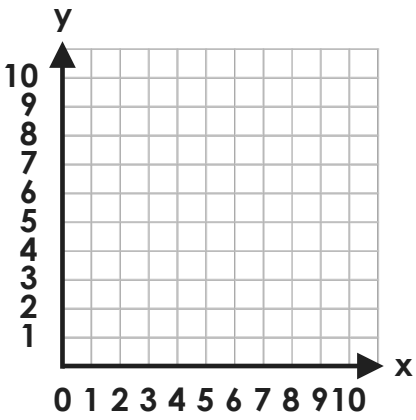


The graph (does/does not) _____ show a proportional relationship because…

Determine if the relationship is proportional.

1.

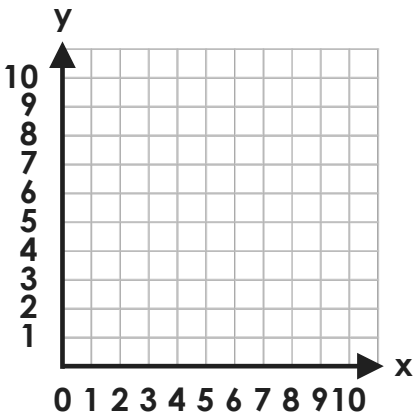
x	y
2	0
3	2
4	4
5	6



The graph (does/does not) _____ show a proportional relationship because…

2.

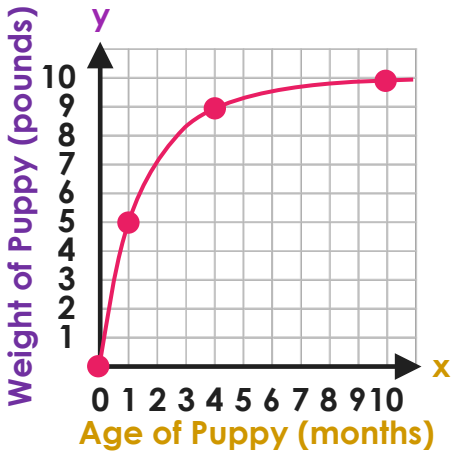
x	y
0	1
1	4
2	7
3	10



The graph (does/does not) _____ show a proportional relationship because…

Read the problem and write your explanation.

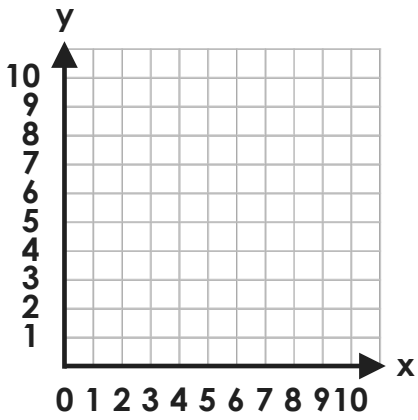
Jay thinks he drew a proportional graph about a puppy's weight and age. Explain why he is incorrect.



Determine if the relationship is proportional.

1.

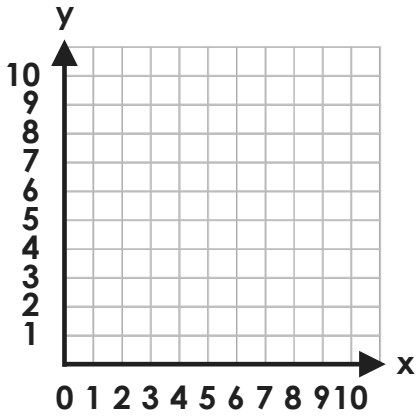
x	y
4	2
6	3
8	4
10	5



The graph (does/does not) _____ show a proportional relationship because…

2.

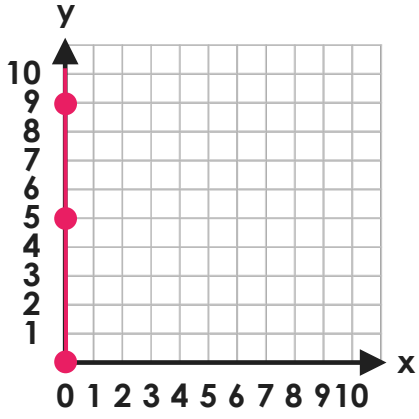
x	y
1	3
2	5
3	7
4	9



The graph (does/does not) _____ show a proportional relationship because…

Read the problem and write your explanation.

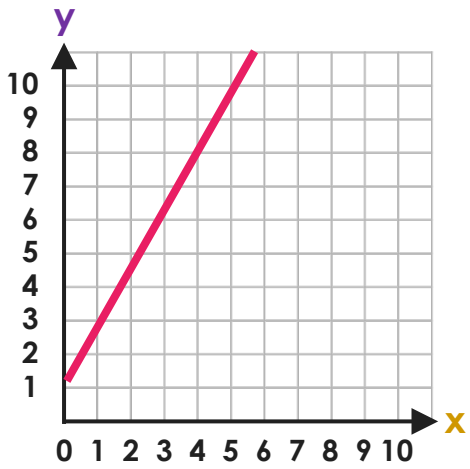
Cooper thinks she drew a proportional graph because it has a straight line that goes through the origin. Explain why she is incorrect.



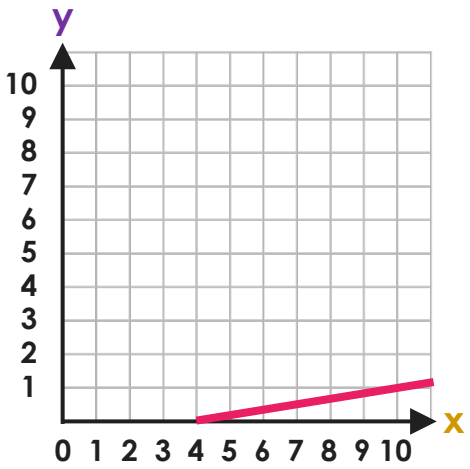
Read and solve the problem.

Which graphs do not show proportional relationships?

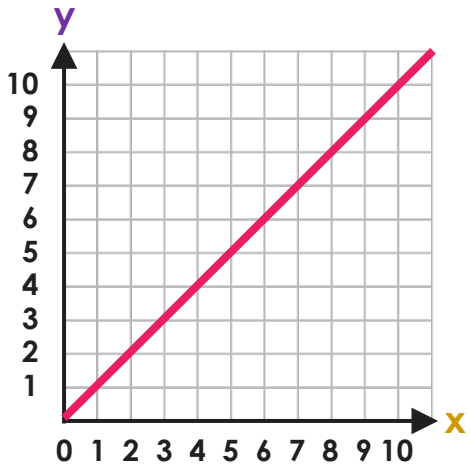
A



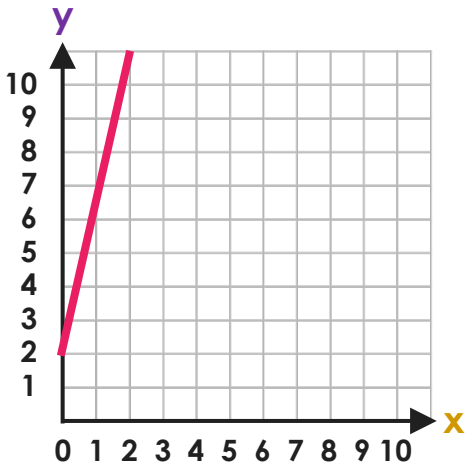
B



C



D



Graphs _____ do not show proportional relationships because…

Create your own proportional relationship.
Be ready to explain to the class.