Math Virtual Learning

Math 7/Pre-Algebra
Direct Proportion

April 13, 2020

Grade 7/Direct Proportion
Lesson: April 13, 2020

Objective/Learning Target:
Students will identify direct proportions, find the constant of proportionality, and write direct proportions.

Let's Get Started:

Click on the Link: **Proportional versus Non Proportional Relationships**

Warm-Up

On a seperate piece of paper, tell whether y is directly proportional to x. If so, find the constant of proportionality. Then write a direct proportion equation.

X	Y
1	4
2	8
3	12
4	16

X	2	4	6
Y	160	120	80

Warm-Up Answers

On a separate piece of paper, tell whether y is directly proportional to x. If so, find the constant of proportionality. Then write a direct proportion equation.

X	Y
1	4
2	8
3	12
4	16

Yes, y is directly proportional to x.

The constant of proportionality is 4.

Y/X=4

4/1=4

8/2=4

12/3=4

16/4=4

X	2	4	6
Y	160	120	80

No, y is not directly proportional to x.

y/x   160/2=80   120/4=30

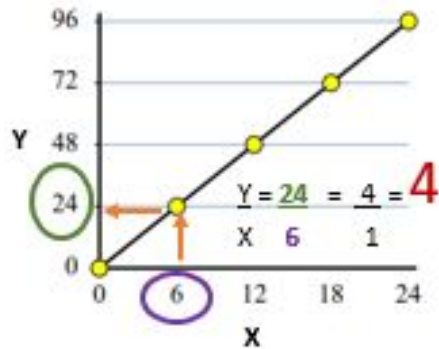80/6=13.33

Examples and NON-Examples of direct proportions.

Examples - **YES** directly proportional

y = 3x

4y = 20x → $\frac{4y}{4} = \frac{20x}{4}$

y = 5x

The graph:
- is a straight line
- goes through (0,0)
- is increasing

$\frac{Y}{X} = \frac{24}{6} = \frac{4}{1} = 4$

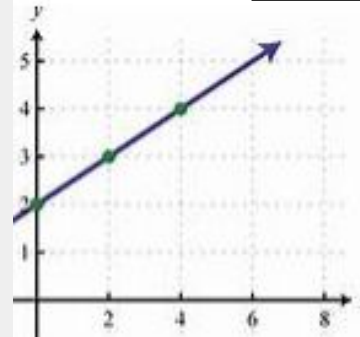| Cans of Paint (x)	2	4	7	8	6
Bird Houses Painted (y)	8	16	28	32	24

For every can of paint, you could paint __4__ bird houses.
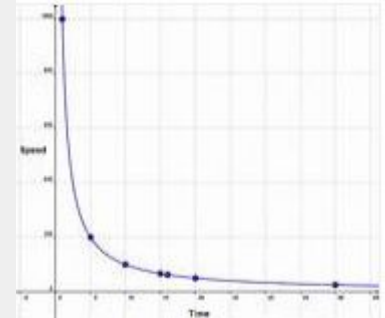
NON-Examples - **NO** *not* directly proportional

y = 5x - 2
Y = 2x² + 3

No, because of the addition, subtraction, and the squared x.

No, because the line doesn't go through (0,0).

No, because this is not a straight line.

x (number of tickets)	0	2	4	6	8
y (total cost in dollars)	20	24	28	32	36

No, because the y/x ratios are NOT proportional.

Practice

On piece of paper, tell whether each relationship represents a direct proportion. If so, identify the constant of proportionality.
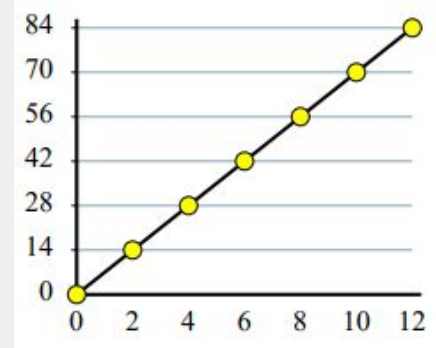
1. $3y+7=x$

2. $a=1.2b$

3.

X	Y
3	10
6	30
9	70

4.
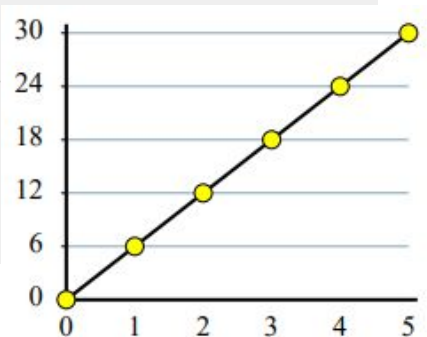
X	2	4	6
Y	40	80	120

5.

6.

Practice Answers page 1

Tell whether each relationship represents a direct proportion. If so, identify the constant of proportionality.

1. $3y + 7 = x$

     -7   -7

  $\frac{1}{3}(3y) = (x-7)\frac{1}{3}$

y=⅓(x-7)

No, y is not directly proportional to x because the equation is not in y=kx form.

2. $a = 1.2b$

Yes, a is directly proportional to b. The constant of proportionality is 1.2.

3.

X	Y
3	10
6	30
9	70

No, y is not directly proportional to x because there is not a constant of proportionality.

4.

X	2	4	6
Y	40	80	120

Yes, y is directly proportional to x. The constant of proportionality is 20. The direct proportion equation is y = 20x.

Practice Answers page 2

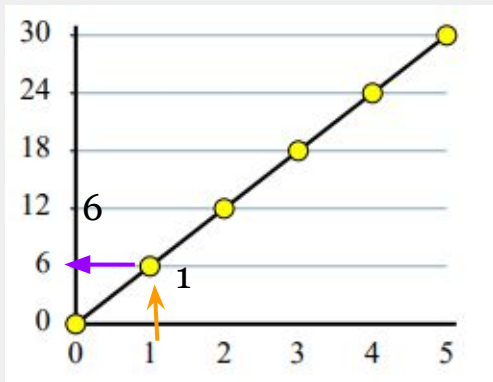Tell whether each relationship represents a direct proportion. If so, identify the constant of proportionality.

5.

y/x

6/1=6

12/2=6

18/3=6

6

1

Yes, the graph shows a direct proportion.
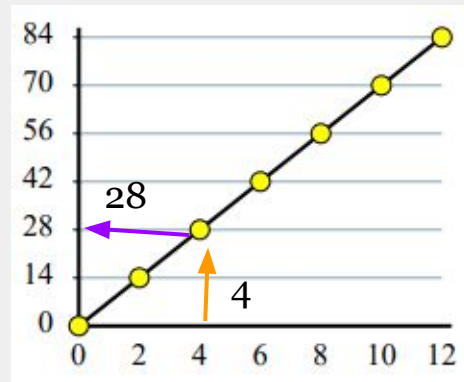
The constant of proportionality is 6.

6.

y/x

14/2=7

28/4=7

42/6=7

28

4

Yes, the graph shows a direct proportion.

The constant of proportionality is 7.

Practice

Identify Proportional Relationships

1. Click on the link above.
2. Click on Yes or No

Note: Be careful and pay attention to where the Yes and No appear on the screen - they switch places from time to time.

Look at the graph below. Is the total distance ran proportional to the number of trips to school.
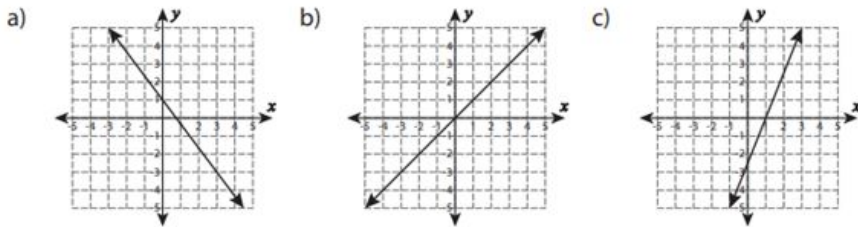

No | Yes

1. Which equation is *NOT* an example of a direct proportion equation? _____

   A. $y = \frac{-7}{3}x + 1$ B. $y = \frac{5}{16}x$ C. $y = 4x$ D. $y = -9x$

2. Using the equation form **y = kx**, name the constant of proportionality (k) for each equation below.

   $y = 5x \rightarrow k = $ ____ $y = \frac{1}{2}x \rightarrow k = $ ____ $y = -1.7x \rightarrow k = $ ____

3. Select the graph that shows a direct proportion relationship.

   a)   b)   c)

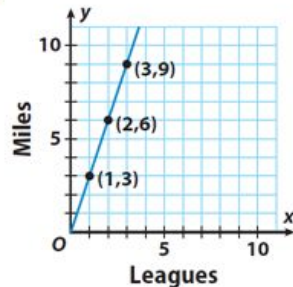4. Select the table that shows a direct proportion relationship.

   a.)

x	1	3	9	5
y	2	6	18	10

   b.)

x	2	4	8	6
y	6	12	24	21

5. Identify the constant of proportionality (unit rate) on the graph.

Practice Answers

1. Which equation is *NOT* an example of a direct proportion equation? __A__ **because of the + 1**

   A. $y = \frac{-7}{3}x + 1$ B. $y = \frac{5}{16}x$ C. $y = 4x$ D. $y = -9x$
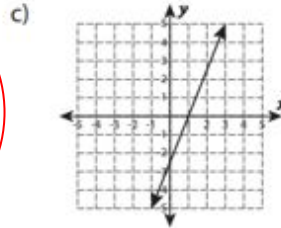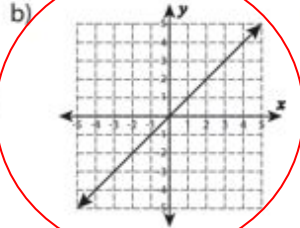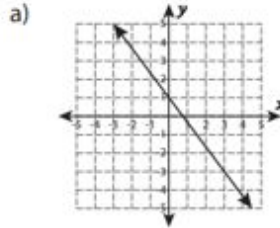
2. Using the equation form **y = kx**, name the constant of proportionality (k) for each equation below.

   $y = 5x \rightarrow k = $ **5** $y = \frac{1}{2}x \rightarrow k = $ **½** $y = -1.7x \rightarrow k = $ **-1.7**

3. Select the graph that shows a direct proportion relationship.

   a)   b)   c)

   B   because
   - **It is a straight line**
   - **It goes through the origin**
   - **It is increasing (going up)**

4. Select the table that shows a direct proportion relationship.

   a.)

x	1	3	9	5
y	2	6	18	10

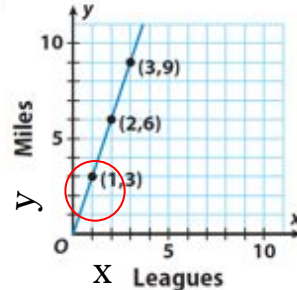   b.)

x	2	4	8	6
y	6	12	24	21

   Table a because the ratio of y to x is proportional. y/x = 2

5. Identify the constant of proportionality (unit rate) on the graph.

   K = y/x
   K = 3/1
   K = 3

Additional Links

Constant of Proportionality - Graphs - One Atta Time
Type answer in the box.
Click "Check Answer"
Click "Submit Answer"
Click "Next Problem"

Rates from Graphs
(Click the green arrow in the bottom right corner of the screen)