

## Topic: Equations of Proportional Relationships

Name \_\_\_\_\_

1. For every 5 minutes that Jenny runs, she covers 574 meters.

Let  $y$  represent the distance Jenny runs in  $x$  minutes. Construct an equation relating  $x$  and  $y$ .

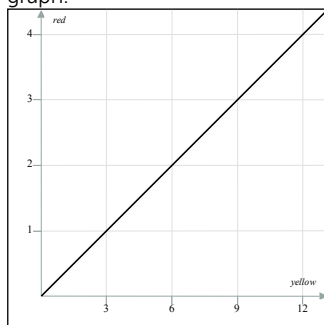
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2. Luke serves 5 cups of coffee every 10 minutes.

Using  $y$  for the number of cups of coffee, and  $x$  for the amount of minutes that have passed, write an equation that represents this proportional relationship.

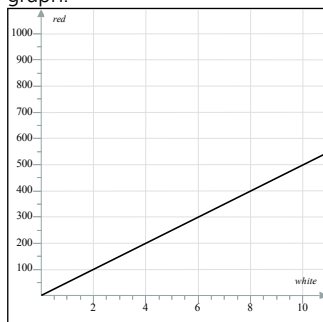
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3. The amount of yellow and red paint needed to make 'sunset orange' is shown in the graph.



Let  $x$  represent the amount of yellow paint and  $y$  represent the amount of red paint needed. What is the equation of this line?

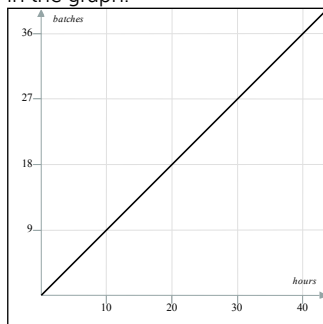
4. The amount of white and red paint needed to make 'flamingo pink' is shown in the graph.



- a. Let  $x$  represent the amount of white paint and  $y$  represent the amount of red paint needed. What is the equation of this line?
- b. What does the equation of the line tell you?

- A 1 can of red paint requires 50 cans of white paint to make the perfect flamingo pink.
- B For every  $\frac{1}{10}$  cans of white paint, you need 50 cans of red paint.
- C 1 can of white paint requires 50 cans of red paint to make the perfect flamingo pink.
- D For every  $\frac{1}{10}$  cans of red paint, you need to use 5 cans of white paint.

5. The number of batches of cookies that can be made in a bakery every hour is shown in the graph.



What is the equation of this line?

6. The original of a printed image measures 6.5 centimeters in width and 26 centimeters in length. When a customer wants to print a copy of this original they are offered prints in various sizes, but the width and length are in the same ratio as the original so that the photo does not appear distorted.

- a. If  $x$  represents the width and  $y$  represents the length of the printing size, complete the equation relating  $x$  and  $y$ .

$$y = \square x$$

- b. What would be the length of a copy of the original if the width of the copy is 10 cm?

$$\text{Length} = \square \text{ cm}$$

7. During a group gym session, participants need to do 'double unders' skipping for 7 minutes. Those who can't do double unders are given the option of doing single skips, but they must do more.

The table shows the pattern of how many double under and single skips participants had to do for the first 4 minutes.

Time ( $t$ minutes)	1	2	3	4
Double under skips ( $x$ )	12	24	36	48
Single skips ( $y$ )	24	48	72	96

- a. Is the number of double under skips proportional to the number of minutes?

A No

B Yes

- b. Form an equation for  $x$ , the number of double under skips done in  $t$  minutes.
- c. How many double under skips did participants do in 7 minutes?
- d. For participants who did single skips, how many single skips counted as 1 double under skip?
- e. Form an equation relating  $x$ , the number of double under skips, to  $y$ , the number of single skips.
- f. How many single skips did participants have to do in 7 minutes?

8. A car dealership has received 72 of the latest model Ford. The dealership hopes to have sold all of them within 8 weeks.

a. The number sold by the end of the second and fourth weeks is shown in the table.

Week ( $w$ )	0	1	2	3	4
Number sold ( $n$ )	<input type="text"/>	<input type="text"/>	12	<input type="text"/>	24

Assuming the new Fords are being sold at a constant rate, complete the table.

- b. Form an equation relating  $w$  (the number of weeks passed) and  $n$  (the number of cars sold).
- c. If the new models continue to be sold at this rate, how many will be sold in 8 weeks?
- d. How many of the new models will remain after 8 weeks?
- e. How many new models would they have had to sell each week to have had them all sold in 8 weeks?

9. The cost of parking for various amounts of time was recorded at 4 different locations in the city.

Determine if  $y$  is proportional to  $x$ .

Number of hours ( $x$ )	Cost of parking ( $y$ )
3	\$10.50
3.5	\$13.25
11	\$38.50
6	\$19.50

- a. At the location where parking cost \$38.50, what was the cost per hour? Give your answer to the nearest cent.
- b. Is  $x$  proportional to  $y$ ?

A Yes

B No

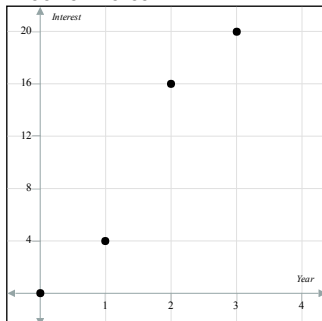
10. Eileen and Sally have used two different investment strategies to enhance their savings. The amount of interest each has earned after  $t$  years is presented in the table and graph. -----

Sally's Interest Earned

Years ( $t$ )	0	1	2	3
Interest earned ( $y$ )	0	4	8	12

- a. For who was the interest earned proportional to the number of years passed?

Eileen's interest



- A Eileen
  B Sally
- C Both

- b. Form an equation for  $y$ , the amount of interest Sally earned, after  $t$  years.
- c. Eileen withdraws her money when she has earned a total of \$80 interest. Find the number of years,  $t$ , that Sally will need to invest her money to earn the same amount of interest.