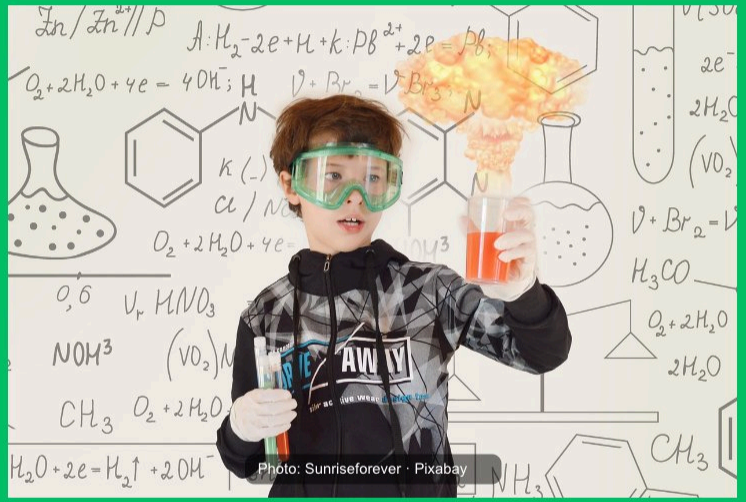
Same Rate, Every Time

Proportional relationships | Grade 7 Math



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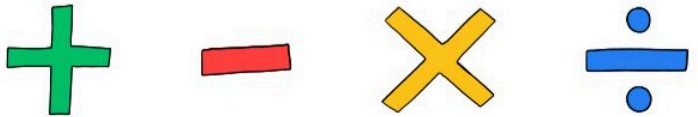
Today we will...

WE ARE LEARNING TO

- Recognize when two quantities scale together
- Represent proportional links as tables, graphs, equations

SUCCESS LOOKS LIKE

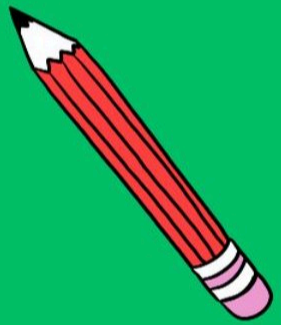
- ✓ I can test ratios to decide if proportional
- ✓ I can find unit rate and write y = kx
- ✓ I can explain points (0,0) and (1,r)



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$a^2+b^2=c^2$

3 checks for proportional?



1. Divide y by x for each pair
2. Check if answer stays exactly same
3. Check graph is straight line through (0,0)

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We see it 4 ways

Table

Each y divided by x gives same number.

Graph

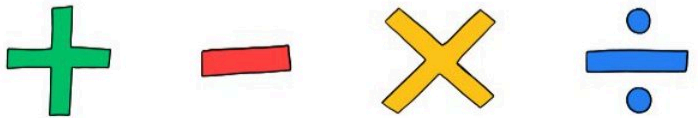
Points make straight line through origin.

Equation

Fits y equals k times x with no extra.

Words

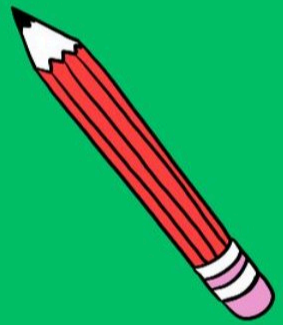
One quantity is always rate times other.



$a^2+b^2=c^2$

Where do you spot it?

Where do you notice same-rate relationships most in life?



- **A** Cooking and recipes
- **B** Sports and speed
- **C** Shopping and prices
- **D** Travel and distance

Vote with your hands, then explain why.

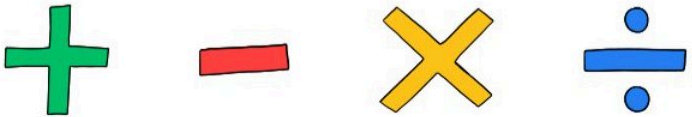
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Watch: What makes it proportional?



▶ 0:00 – 3:49

- Listen for equivalent ratios in tables
- Spot straight line through origin
- Thumbs up if you hear unit rate



$a^2+b^2=c^2$

Key words

proportional relationship

Two quantities with constant ratio y to x.

constant of proportionality

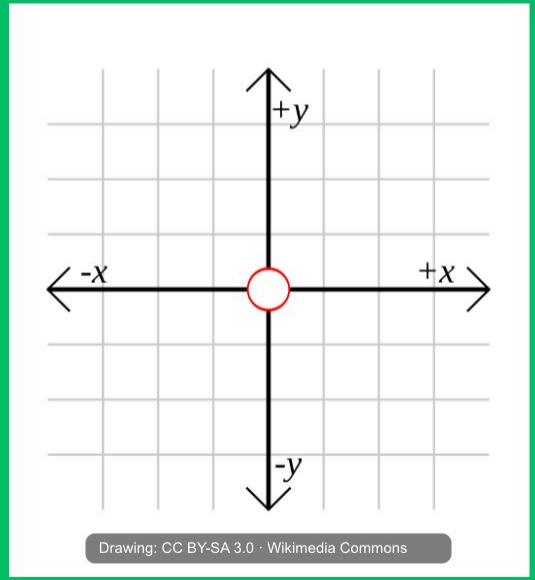
Fixed number k in y = k x.

unit rate

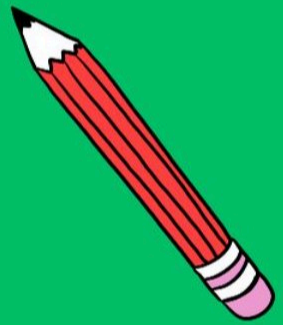
Amount of y that goes with 1 of x.

origin

Point (0,0) where axes cross.

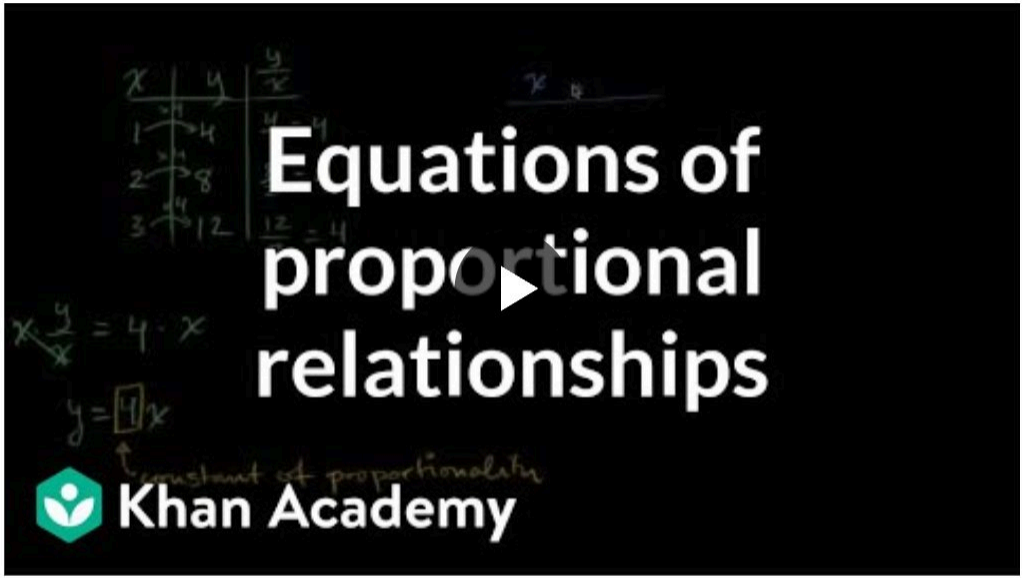


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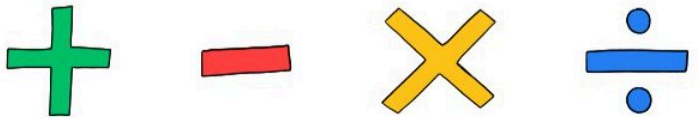
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Watch: Writing y = k x



▶ 0:00 – 5:00

- Find k by dividing y by x
- See how table matches equation
- Notice point (1, r) shows unit rate



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$a^2+b^2=c^2$

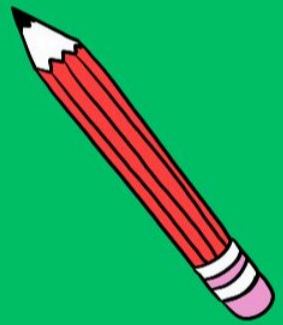
Your task

In pairs, build one proportional example with table, graph, and equation.

1. Make a table where y divided by x is constant
2. Graph it: straight line through (0,0)
3. Write y = k x and label (1, r)

15 min

In pairs



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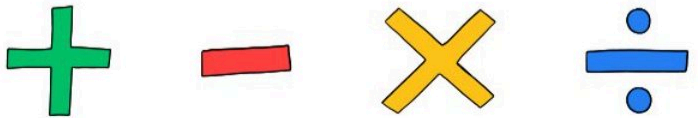
Proportional vs. not

Proportional

- Ratio y divided by x stays same
- Graph is straight line through (0,0)
- Equation is y = k x, no extra

Not proportional

- Ratio y divided by x changes
- Line misses origin or bends
- Equation has plus or minus extra



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$a^2+b^2=c^2$

What could this be?

A stand charges
$3.00 for 2 cups,
$6.00 for 4 cups.
What for 6 cups?

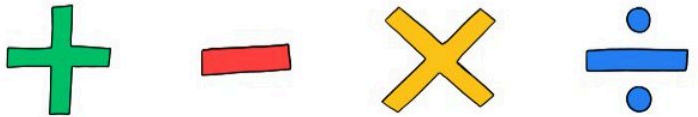




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Quick quiz

1. Table x: 1,2,3 and y: 3,6,9. Proportional? What is k?
2. Graph is straight but crosses y at 2. Proportional?
3. 5 pencils cost $10.00. Cost for 8 at same rate?
4. Point (1,r) shows $2.50 per pound. What is r?



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