



Find the constant of proportionality using the equation $k = y \times \{ displaystyle \ k = yx \}$ when ratios are directly proportional (both increases as the other decreases at the same rate). Use the constant of proportionality to determine what value y {\displaystyle y} will be at any value of x {\displaystyle x} so you can graph the coordinates. The constant slope. When two variables are proportional, that means they both change at the same rate. If you plot them on a graph, you can draw a straight line between all of the points that goes through the origin of the graph. The constant of proportionality is the slope of that line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also be written as a ratio y : x {\displaystyle y:x} or a fraction y x {\displaystyle {\frac {y}{x}}}. You can also think of x {\displaystyle x} as the independent variable and y {\displaystyle y} as the dependent variable, since y {\displaystyle y} changes in relation to the change in x {\displaystyle y} as the dependent variable and y {\displaystyle y} as the dependent variable and y {\displaystyle y} as the dependent variable, since y {\displaystyle y} as the dependent variable and y {\displaystyle x} as the variable and y {\displaystyle y} as the dependent variable and y {\displaystyle y} as the dependent variable and y {\displaystyle x} as the variable and y {\displaystyle y} as the dependent variable and y {\displaystyle x} as the variable and y {\displaystyle x} as the variable and y {\displaystyle y} as the dependent variable and y {\displaystyle x} as the variable and y a direct proportional relationship. Direct proportionality is represented by the equation $y = k x \{ displaystyle \ y = kx \}$ where $k = y x \{ displaystyle \ k = y x \}$. Use this version if you're trying to find the constant of proportionality and already have the values for the two variables. The formula d = r t {\displaystyle d=rt} (distance = rate x time), which you might recognize from science class, is another version of the equation for the constant of proportionality: Ratios are inversely proportional if one amount decreases at the same rate that the other increases. Inverse proportionality is represented by the equation $y = k x \{ \{x\} \} \}$ where $k \{\{x\}\} \}$ and $k \{x\} \}$ and $k \{x\} \}$ where $k \{\{x\}\} \}$ where $k \{\{x\}\} \}$ and $k \{x\} \}$ and $k \{x$ (4, 20) {\displaystyle x} coordinate of any point is the denominator, while the y {\displaystyle x} coordinate is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle (4,20)}, (8, 40) (12, 60) are the same as the ratios 20:4 (displaystyle 20:4), 40:8 (displaystyle 40:8), and 60:12 (displaystyle 40:8), an looking at direct or inverse proportionality. Look at the numbers in the set of ratios you've been given. If they all increases, you've got inverse proportionality. For example, look at the set 20 4 {\displaystyle {\frac {20}{4}}}, 40 8 {\displaystyle {\frac {40}{8}}, and 60 12 {\displaystyle {\frac {60}{12}}. In each ratio, the values of the numerator and the denominator both increase, so you're looking at direct proportionality. What if you had 1 12 {\displaystyle {\frac {1}{12}}}, 2 6 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle {\frac {3}{4}}}? The values of the denominator decrease as the values of the numerator increase, so you're looking at inverse proportionality. 3 Plug the values from one of the ratios have direct proportionality, use the equation k = y x {\displaystyle k={\frac {y}{x}}}. For inverse proportionality, use the equation k = y x {\displaystyle k=x}. To continue from the previous example, take the first ratio of 20 4 {\displaystyle {\frac $\{20\}{4}\}=5$ }. Since the set is directly proportionality is 5 {\displaystyle 5}. What about the inverse set? Take the ratio 1 12 {\displaystyle {\frac $\{20\}{4}\}=5$ }. Your constant of proportionality is 5 {\displaystyle 5}. numbers into the equation $k = y x \{ displaystyle k = (1), (12) = 12 \}$. Your constant of proportionality is 12 $\{ displaystyle 12 \}$. 4 Check your work with the other ratios. If the ratios are proportional, the constant of proportionality will be the same for all of them. If any of them are different, then the ratios aren't proportional and there is no constant of proportionality. Try this on your own with the ratios in the set 20 4 {\displaystyle {\frac {40}{3}} , 40 8 {\displaystyle {\frac proportional! This also applies to ratios that are inversely proportional. For example, in the set 1 12 { $displaystyle {frac {1}{12}}$, 2 6 { $displaystyle {frac {3}{4}}$, plugging each ratio, so they are inversely proportional. For example, in the set 1 12 { $displaystyle {frac {3}{4}}$, plugging each ratio, so they are inversely proportional. For example, in the set 1 12 { $displaystyle {frac {1}{12}}$, 2 6 { $displaystyle {frac {1}{12}}}$, 2 6 {displaystyleinversely proportional. 5 Determine other values in the series using the constant of proportionality. Now that you know the constant of proportionality, you can figure out what the value of y {\displaystyle y} would be for any value of x {\displaystyle y}. [4] Use the equation $y = k x {\displaystyle y=kx}$ if the set of ratios is directly proportional. If x $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ is 4 $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ is 4 $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ is 4 $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ is 4 $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ is 4 $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x} \right)$ is 4 $\left(\frac{k}{x} \right)$ if the set of ratios is inversely proportional. 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If x $\left(\frac{k}{x} \right)$ is 4 $\left(\frac{k}{x} \right)$ if the set of ratios is inversely properties is 1. If x \left(\frac{k}{ proportionality is 12 {\displaystyle 12}, y {\displaystyle 3} (y = 124 = 3 {\displaystyle 4} = 3 {\displays $\left(\frac{35}{5}\right)$. Hint: All of the values increase, so use the equation for direct proportionality: $k = y x \left(\frac{y}{x}\right)$. 2 Find the constant of proportionality for 105 - 2 $\left(\frac{105}{2}\right)$, - 35 6 $\left(\frac{-105}{2}\right)$, - 35 6 $\left(\frac{-105}{2}\right)$, - 35 6 $\left(\frac{-105}{2}\right)$, - 21 10 $\left(\frac{105}{2}\right)$. {\frac {-21}{10}} , and - 15 14 {\displaystyle {\frac {-15}{14}} . [5] Hint: The y {\displaystyle y} values are decreasing, so use the equation for inverse proportionality: k = y x {\displaystyle k=yx} . 3 The slowest mammal in the world, the sloth, moves at a rate of 6 {\displaystyle 6} feet per minute. How far will Flash the sloth have gone in 5 {\displaystyle 5} minutes? And how long will it take Flash to complete the 100-yard dash? Hint: 100 yards is 300 feet. 4 You're on a road trip. Each time you get gas, you record the number of miles you drove and the amount of gas your car used: 224 {\displaystyle 224} miles on 8 {\displaystyle 280} miles on 10 $\left(\frac{14}{2}\right)\$ and 355 $\left(\frac{35}{5}\right)\$ and 12 $\left(\frac{35}{5}\right)\$ and {\displaystyle 7}, so that's your answer. Since all the ratios in the set have the same constant and the values are all increasing, you also know that this series is directly proportionality is - 210 {\displaystyle -210}. Since the y {\displaystyle y} values are decreasing, you simply multiply the numbers together to get and the values are all increasing, you also know that this series is directly proportionality is - 210 {\displaystyle -210}. value for the constant of proportionality, k {\displaystyle k} using the equation k = y x {\displaystyle k=yx}. Before you even start multiplying, you can already tell that each of the ratios is going to simplify to a negative number. All that's left is to multiply each ratio to see that they all simplify to - 210 {\displaystyle -210} :[6] For 105 - 2 $\left(\frac{105}{-2}\right), k = (105)(-2) = -210 \left(\frac{-105}{-2}\right), k = (-105)(-2) = -210 \left(\frac{-105}{-2}\right), k$ $\{-21\}$ (10}}, k = (-21)(10) = -210 {\displaystyle k=(-15)(14)=-210}. For -15 14 {\displaystyle {-15}(14)}, k = (-15)(14)=-210 {\displaystyle k=(-15)(14)=-210}. For -15 14 {\displaystyle k=(-15)(14)=-210}. For -15 {\displays minutes and complete the 100-yard dash in 50 {\displaystyle 50} minutes. Start this problem by finding the constant of proportionality. You know you're going to be working with directly proportionate ratios because the more minutes pass, the further Flash will go, so you use the equation k = y x {\displaystyle k={\frac {y}{x}}}. The distance Flash Flash will go in 5 {\displaystyle 5} minutes, use the equation for direct proportionality, $y = k x {\displaystyle y=kx}$. Here, x {\displaystyle 30} (y = (6)(5)=30}). To find out how long it will take Flash to complete the 100-yard (300 feet) dash, use the same equation, but solve for x {\displaystyle x} instead. Start with 300 = 6 x {\displaystyle 300=6x}, then divide each side by 6 {\displaystyle 28} miles to the gallon. The numbers for gallons of gas aren't in sequential order, but if you shuffle them around, you see that the values for both gas and miles driven are increasing—so this is a direct proportionality problem. The number of miles you drive depends on the gallons of gas you have in your car, so miles driven is the y {\displaystyle y} variable. Now, all you need to do is plug those values into the equation formation for a set of the equation for a set of the set direct proportionality: $k = 224 8 = 28 \left\{ \text{s} = 28 \left\{ \text{s} = 280 10 = 28 \right\} \right\} \right\} \right\} \right\}$ proportional relationship. But if the line doesn't go through the origin, the points are not proportional. When graphing ratios, the first number (or numerator of a fraction) is the y {\displaystyle y} coordinate and the second number (or denominator of a fraction) is the x {\displaystyle x} coordinate.[7] 2 Find the constant of proportionality for each ratio. If any of the ratios in the set has a different constant of proportionality than the others, the ratios in the set are not proportional. But if all of the ratios have the same constant of proportionality, then they are proportional. But if all of the ratios have the same constant of proportional. But if all of the ratios have the same constant of proportional. But if all of the ratios have the same constant of proportional to the set are not proportional. But if all of the ratios in the set are not proportional. But if all of the ratios have the same constant of proportional to the set are not proportional. But if all of the ratios in the set are not proportional to the set are not proportional. But if all of the ratios in the set are not proportional. k=yx} if the value of one variable goes up and the other goes down. Advertisement Ask a Question Advertisement Thanks for reading our article! If you'd like to learn more about math, check out our in-depth interview with JohnK Wright V. Co-authored by: Texas Certified Math Teacher This article was co-authored by JohnK Wright V and by wikiHow staff writer, Jennifer Mueller, JD. JohnK Wright V is a Certified 8-12 Mathematics Teacher at Bridge Builder Academy in Plano, Texas. With over 20 years of teaching experience, he is a Texas SBEC Certified 8-12 Mathematics Teacher. He has taught in six different schools and has taught pre-algebra, algebra 2, pre-calculus, statistics, math reasoning, and math models with applications. He was a Mathematics Major at Southeastern Louisiana and he has a Bachelor of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior Updated: January 31, 2025 Views: 17,182 Categories: Mathematics Print Send fan mail to authors Thanks to all authors for creating a page that has been read 17,182 times. Any letter of the alphabet - or indeed other alphabets - can be used. The letters c and k are the more common symbols because they represent the phonetic start of "constant". Variables are often represented by the initial letter of the variable: v for velocity, t for time, m for mass and so on, or by letters at either end of the alphabet: a, b, c or x, y, z. Clearly, it can be confusing to use any of these as the constant of proportionality. So, through convention, k was selected as the default symbol. In order to continue, m for mass and so on, or by letters at either end of the alphabet: a, b, c or x, y, z. Clearly, it can be confusing to use any of these as the constant of proportionality. enjoying our site, we ask that you confirm your identity as a human. Thank you very much for your cooperation. Find the constant of proportionality using the equation k = y x {\displaystyle k={\frac {y}{x}}} when ratios are directly proportionality using the equation k = y x {\displaystyle k={\frac {y}{x}}} {\displaystyle k=yx} when ratios are inversely proportional (one increases as the other decreases at the same rate). Use the constant of proportionality to determine what value y {\displaystyle x} so you can graph the coordinates. The constant of proportionality is the rate at which the x and y variables change. In other words, this is a constant slope. When two variables are proportional, that means they both change at the same rate. If you plot them on a graph, you can draw a straight line between all of the points that goes through the origin of the graph. The constant of proportionality is the slope of that line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also be written as a ratio y : x {\displaystyle y} as the dependent variable, since y {\displaystyle y} as the independent variable and y {\displaystyle y}. You can also think of x {\displaystyle y} as the dependent variable and y {\displaystyle y} as the dependent variable, since y {\displaystyle y} as the dependent variable and y {\displaystyle y} as the dependent variable and y {\displaystyle y} as the dependent variable, since y {\displaystyle y} as the dependent variable and y {\displaystyle x} as the dependen proportionality can never be 0 {\displaystyle 0}. Advertisement 1 Direct proportionality: If two variables both increase at the same rate, they have a direct proportionality is represented by the equation y = k x {\displaystyle y=kx} where k {\displaystyle k} is the constant of proportionality. The same equation can also be written $k = y x \{ displaystyle k = \{ frac \{y\} \} \}$. Use this version if you're trying to find the constant of proportionality and already have the values for the two variables. The formula $d = r t \{ displaystyle d = r \}$ proportionality: 2 Inverse proportionality: Ratios are inversely proportionality. [2] The same equation can also be written k = y x{\displaystyle k=yx}. Use this version to find the constant of proportionality when you already have the values for the other two variables. Advertisement 1 Set up each ratio as a fraction. In a ratio, the first number is the denominator of the fraction and the second number is the numerator. On a graph, the x {\displaystyle x} coordinate of any point is the denominator, while the y {\displaystyle (4, 20)}, (4, 20) are the same as the ratios 20:4 , 40:8 , 20 4 {\displaystyle {\frac {20}{4}}}, 40 8 {\displaystyle {\frac {40}{8}}}, and 60 12 {\displaystyle {\frac {60}{12}}}. 2 Determine whether you're looking at direct or inverse proportionality. Look at the numbers in the set of ratios you've been given. If they all increase, they're directly proportional. On the other hand, if one set of values increases and the other set of values decreases, you've got inverse proportionality. For example, look at the set 20 4 {\displaystyle {\frac {20}{4}}, and 60 12 {\displaystyle {\frac {60}{12}}}. In each ratio, the values of the numerator and the denominator both increase, so you're looking at direct proportionality. What if you had 1 12 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle {\frac {3}{4}}}? The values of the numerator increase, so you're looking at inverse proportionality. 3 Plug the values of the ratios into the proper equation. If the ratios have direct proportionality, use the equation $k = y x \{ displaystyle k = yx \}$. For inverse proportionality, use the equation $k = y x \{ displaystyle k = yx \}$. For inverse proportionality, use the equation $k = y x \{ displaystyle k = yx \}$. For inverse proportionality, use the equation $k = y x \{ displaystyle k = yx \}$. For inverse proportionality, use the equation $k = y x \{ displaystyle k = yx \}$. For inverse proportionality, use the equation $k = y x \{ displaystyle k = yx \}$. $\{20\}\{4\}=5\}$. Your constant of proportionality is 5 {\displaystyle 5}. What about the inverse set? Take the ratio 1 12 {\displaystyle 12}. 4 Check 24} to get k = (1)(12) = 12 {\displaystyle k=yx} to get k = (1)(12) = 12 {\displaystyle 12}. Your constant of proportionality is 12 {\displaystyle 12}. 4 Check 24} your work with the other ratios. If the ratios are proportionality will be the same for all of them. If any of them are different, then the ratios aren't proportionality. Try this on your own with the ratios are proportionality. Try this on your own with the ratios are proportionality will be the same for all of them. If any of them are different, then the ratios are proportionality. Try this on your own with the ratios are proportionality. {8}}}, and 60 12 {\displaystyle {\frac {60}{12}}}. You'll see that you get 5 {\displaystyle 5} for each ratio, which tells you this ratios are indeed directly proportional. For example, in the set 1 12 {\displaystyle {\frac {1}{12}}}, 2 6 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle {\frac {3}{4}}}, plugging each ratio into the equation k = y x {\displaystyle k=yx} gets you a constant of 12 {\displaystyle 12} for each ratio, so they are inversely proportional. 5 Determine other values in the series using the constant of proportionality, you can figure out what the value of y $\left(\frac{y = (7)(5)=35}\right)$. Use the equation $y = k \times \left(\frac{y = (7)(5)=35}\right)$. Use the equation $y = k \times \left(\frac{y = (7)(5)=35}\right)$. Use the equation $y = k x \{ displaystyle y = \{ frac \{k\} \} \}$ if the set of ratios is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle 12 \}$, y $\{ displaystyle y \}$ would be 3 $\{ displaystyle y \}$ would be 3 $\{ displaystyle y \}$ if the set of ratios is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle 12 \}$, y $\{ displaystyle y \}$ would be 3 $\{ displaystyle y \}$ if the set of ratios is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle y \}$ would be 3 $\{ displaystyle y \}$ if the set of ratios is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratios is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratios is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratios is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratios is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ is 4 $\{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \} \}$ if the set of ratio is inversely proportional. If $x \{ displaystyle x \}$ if the set of ratio is inversely proportional dis inversely proportional dis in proportionality for 10.5 1.5 {\displaystyle {\frac {10.5}{1.5}}}, 14 2 {\displaystyle {\frac {24.5}{3.5}}}, and 35 5 {\displaystyle {\frac {24.5}{3.5}}}. Hint: All of the values increase, so use the equation for direct proportionality: $k = y x {\displaystyle k={\frac {y}{x}}}. 2$ Find the constant of proportionality for 10.5 1.5 {\displaystyle k={\frac {y}{x}}}. for 105 - 2 {\displaystyle {\frac { $105}{-2}}}, - 105 2 {\displaystyle {\frac {<math>-105}{2}}}, - 35 6 {\displaystyle {\frac {<math>-15}{14}}}, - 21 10 {\displaystyle {\left\{ \frac{105}{14}}, - 21 10 {\left\{ \frac{105}{14}, - 21 {\left\{ \frac{105}{14}}, - 21 {\left\{ \frac{105}{14}, - 21 {\left\{ \frac{105}{14}}, - 21 {\left\{ \frac{105}{14}, - 21$ k=yx}. 3 The slowest mammal in the world, the sloth, moves at a rate of 6 {\displaystyle 6} feet per minute. How far will Flash the sloth have gone in 5 {\displaystyle 5} minutes? And how long will it take Flash to complete the 100-yard dash? Hint: 100 yards is 300 feet. 4 You're on a road trip. Each time you get gas, you record the number of miles you drove and the amount of gas your car used: 224 {\displaystyle 224} miles on 8 {\displaystyle 280} miles on 10 {\displaystyle 112} miles on 4 {\displaystyle 112} miles on 4 {\displaystyle 112} miles on 4 {\displaystyle 280} miles on 10 {\displaystyle 280} miles on 10 {\displaystyle 280} miles on 4 {\displaystyle 280} miles on 4 {\displaystyle 112} miles on 4 {\displaystyle 112} miles on 4 {\displaystyle 112} miles on 4 {\displaystyle 280} miles on 10 {\displaystyle 112} miles on 4 {\displaystyle 12} miles on so you're looking for the constant of proportionality here. Advertisement 1 The constant of proportionality is 7 {\displaystyle 7}. If you remember your multiplication tables, you know that 14 2 {\displaystyle 7}. If you remember your multiplication tables, you know that 14 2 {\displaystyle 7}. If you remember your multiplication tables, you know that 14 2 {\displaystyle 7}. in the set, you find that both 10.5 1.5 {\displaystyle {\frac {10.5}}} and 24.5 3.5 {\displaystyle {\frac {24.5}}} also simplify to 7 {\displaystyle 7}, so that's your answer. Since all the ratios in the set have the same constant and the values are all increasing, you also know that this series is directly proportional. 2 The constant of proportionality is - 210 {\displaystyle -210}. Since the y {\displaystyle k} using the equation k = y x {\displ simplify to a negative number. All that's left is to multiply each ratio to see that they all simplify to $-210 \left(\frac{105}{2}\right) = -210 \left$ For $-35 \{ \{s_{-35} \{6\}\} \}$, $k = (-35)(6) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-15)(14) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$, $k = (-21)(10) = -210 \{ \{s_{-21} \{10\}\} \}$ have the same constant of proportionality, they are inversely proportional. 3 Flash will go 30 {\displaystyle 30} feet in 5 {\displaystyle 5} minutes. Start this problem by finding the constant of proportionality. You know you're going to be working with directly proportionate ratios because the more minutes pass, the further Flash will go, so you use the equation k = y x {\displaystyle y} ariable and time is the x {\displaystyle y} ariable. You've been told that Flash goes 6 {\displaystyle 6} feet in 1 {\displaystyle 1} minute, so that makes his constant of proportionality 6 = 6 = 6 by a style 3 = 6(6)(5) = 30 \displaystyle y = (6)(5) = 30 \displaystyle y = (6)(5) = 30 \displaystyle 6 \displaystyle 50 \disp {\displaystyle 28} miles to the gallon. The numbers for gallons of gas aren't in sequential order, but if you shuffle them around, you see that the values for both gas and miles driven is the y $\left(\frac{224}{8}\right)=28$ k = 280 10 = 28 (displaystyle x) variable. Now, all you need to do is plug those values into the equation for direct proportionality: k = 224 8 = 28 (displaystyle k={\frac {224}{8}}=28) k = 112 4 = 28 (displaystyle k={\frac {112}{4}}=28) k = 112 4 = 28 (displaystyle k={\frac {224}{8}}=28) k = 112 4 = 28 (displaystyle k={\frac {224}{8}}=28) k = 28 (displaystyle k={\frac {224}{8}}=28) k = 112 4 = 28 (displaystyle Advertisement 1 Plot the points on a graph and draw a line through the points. If the line you drew crosses the origin, the points are not proportional. When graphing ratios, the first number (or numerator of a fraction) is the y {\displaystyle y} coordinate and the second number (or denominator of a fraction) is the x {\displaystyle x} coordinate.[7] 2 Find the constant of proportionality than the others, the ratios in the set are not proportionality for each ratio. If any of the ratios in the set has a different constant of proportionality than the others, the ratios in the set are not proportionality than the others, the ratios in the set are not proportionality for each ratio. then they are proportional. Remember to use k = y x {\displaystyle k=\x} if the values of both variables go up and k = y x {\displaystyle k=yx} if the value of one variable goes up and the other goes down. Advertisement Ask a Question Advertisement Ask depth interview with JohnK Wright V. Co-authored by: Texas Certified Math Teacher This article was co-authored by JohnK Wright V is a Certified Math Teacher at Bridge Builder Academy in Plano, Texas. With over 20 years of teaching experience, he is a Texas SBEC Certified 8-12 was co-authored by JohnK Wright V and by wikiHow staff writer, Jennifer Mueller, JD. JohnK Wright V is a Certified Math Teacher at Bridge Builder Academy in Plano, Texas. Mathematics Teacher. He has taught in six different schools and has taught pre-algebra, algebra 2, pre-calculus, statistics, math reasoning, and math models with applications. He was a Mathematics Major at Southeastern Louisiana and he has a Bachelor of Science from The University of the State of New York (now Excelsion University) and a Master of Science in Computer Information Systems from Boston University. This article has been viewed 17,182 times. Co-authors: 7 Updated: January 31, 2025 Views: 17,182 times. Find the constant of proportionality using the equation $k = y x \{ displaystyle k = yx \} \}$ when ratios are directly proportional (both increases at the same rate). Use the constant of proportional (both increases at the same rate). proportionality to determine what value y {\displaystyle y} will be at any value of x {\displaystyle x} so you can graph the coordinates. The constant slope. When two variables are proportional, that means they both change at the same rate. If you plot them on a graph, you can draw a straight line between all of the points that goes through the origin of the graph. The constant of proportionality is the slope of that line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also be written as a ratio y : x {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also be written as a ratio y : x {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x,y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x, y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x, y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x, y)} can also think of x a straight line.[1] Graphed coordinates (x, y) {\displaystyle (x, y)} can als {\displaystyle x} as the independent variable and y {\displaystyle y} as the dependent variable, since y {\displaystyle y} as the dependen proportional relationship. Direct proportionality is represented by the equation $y = k x \{ displaystyle \ y = kx \}$ where k $\{ displaysty$ the two variables. The formula d = r t {\displaystyle d=rt} (distance = rate x time), which you might recognize from science class, is another version of the equation for the constant of proportionality. 2 Inverse proportionality is another version of the equation for the constant of proportionality. represented by the equation $y = k x \{ displaystyle k = yx \}$. Use this version to find the constant of proportionality.[2] The same equation can also be written $k = y x \{ displaystyle k = yx \}$. Use this version to find the constant of proportionality.[2] The same equation can also be written $k = y x \{ displaystyle k = yx \}$. ratio as a fraction. In a ratio, the first number is the denominator of the fraction and the second number is the numerator. (3] For example, the v {\displaystyle x} coordinate of any point is the denominator, while the y {\displaystyle x} coordinate of any point is the denominator, while the y {\displaystyle (4,20)}, (8, 40) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the denominator, while the y {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaystyle x} coordinate of any point is the numerator.[3] For example, the ordered pairs (4, 20) {\displaysty (8,40), and (12, 60) {\displaystyle (12,60)} are the same as the ratios 20:4 {\displaystyle 40:8}, and 60:12 {\displaysty direct or inverse proportionality. Look at the numbers in the set of ratios you've been given. If they all increase, they're directly proportionality. For example, look at the set of values increases and the other set of values decreases, you've got inverse proportionality. For example, look at the set 20 4 {\displaystyle {\frac {20}{4}}}, 40 8 {\displaystyle {\frac {20}{4}}} {\frac {40}{8}}, and 60 12 {\displaystyle {\frac {60}{12}}. In each ratio, the values of the numerator and the denominator both increase, so you're looking at direct proportionality. What if you had 1 12 {\displaystyle {\frac {1}{12}}}, 2 6 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle {\frac {3}{4}}}? The values of the denominator both increase, so you're looking at direct proportionality. What if you had 1 12 {\displaystyle {\frac {1}{12}}}, 2 6 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle {\frac {3}{4}}}? The values of the denominator both increase, so you're looking at direct proportionality. decrease as the values of the numerator increase, so you're looking at inverse proportionality. 3 Plug the values from one of the ratios into the proper equation. If the ratios into the proper equation k = y x {\displaystyle k=yx}. To continue from the previous example, take the first ratio of 20 4 {\displaystyle {\frac {20}{4}}. Since the set is directly proportional, you'd use k = 204 = 5 {\displaystyle k={\frac {20}{4}} = 5}. What about the inverse set? Take the ratio 1 12 {\displaystyle {\frac {1}{12}}} and plug the numbers into proportional and there is no constant of proportionality. Try this on your own with the ratios in the set 20 4 {\displaystyle {\frac {20}{4}}}, 40 8 {\displaystyle {\frac {20}{4}}}, and 60 12 {\displaystyle {\frac {40}{3}}}, and 60 12 {\displaystyle {\frac {40}{3}}}. applies to ratios that are inversely proportional. For example, in the set 1 12 {\displaystyle {\frac {1}{12}}}, 2 6 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle k=yx} gets you a constant of 12 {\displaystyle table ta Determine other values in the series using the constant of proportionality. Now that you know the constant of proportionality, you can figure out what the value of x {\displaystyle x} is 7 $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. If x $\left(\frac{k}{x}\right)$ if the set of ratios is inversely proportional. $\left(\frac{12}{4}=3\right)$, Advertisement 1 Find the constant of proportionality for 10.5 1.5 {\displaystyle 4} = 3 {\displaystyle {\frac {12}{4}=3}, 14 2 {\displaystyle {\frac {12}{4}=3}}, 14 2 {\displaystyle {\frac {12}{4}=3}}, 14 2 {\displaystyle {\frac {12}{4}}=3}} Hint: All of the values increase, so use the equation for direct proportionality: $k = y x \left\{ displaystyle \left\{ \frac{103}{-2} \right\} \right\}$, $-105 2 \left\{ displaystyle \left\{ \frac{105}{-2} \right\} \right\}$, $-35 6 \left\{ displaystyle \left\{ \frac{-35}{6} \right\} \right\}$, $-21 10 \left\{ displaystyle \left\{ \frac{-21}{10} \right\} \right\}$, and -15 14{\displaystyle {\frac {-15}{14}}}. [5] Hint: The y {\displaystyle y} values are decreasing, so use the equation for inverse proportionality: k = y x {\displaystyle 6} feet per minute. How far will Flash the sloth have gone in 5 {\displaystyle 5} minutes? And how long will it take Flash to complete the 100-yard dash? Hint: 100 yards is 300 feet. 4 You're on a road trip. Each time you get gas, you record the number of miles you drove and the amount of gas your car used: 224 {\displaystyle 224} miles on 8 {\displaystyle 280} miles on 10 {\displaystyle 10} gallons, and 112 {\displaystyle 112} miles on 4 {\displaystyle 4} gallons. What is your car's gas mileage? Hint: Gas mileage is the number of miles your car can drive on one gallon of gas, so you're looking for the constant of proportionality here. Advertisement 1 The constant of proportionality here. Advertisement 1 The constant of proportionality here. Advertisement 1 The constant of proportionality is 7 {\displaystyle 7}. If you remember your multiplication tables, you know that 14 2 {\displaystyle {\frac {14}{2}} and 35 5 {\displaystyle {\frac {35}{5}} simplify to 7 {\displaystyle 7}. When you do the basic math for the other two ratios in the set, you find that both 10.5 1.5 {\displaystyle {\frac {14}{2}} and 24.5 3.5 {\displaystyle {\frac {24.5}{3.5}} also simplify to 7 {\displaystyle 7}. So that's your answer. Since all the ratios in the set have the same constant of proportional. 2 The constant of proportional. 2 The constant of proportionality is - 210 {\displaystyle -210}. Since the y {\displaystyle -210}. proportionality, k {\displaystyle k} using the equation k = y x {\displaystyle k=yx}. Before you even start multiplying, you can already tell that each of the ratios is going to simplify to a negative number. All that's left is to multiply each ratio to see that they all simplify to - 210 {\displaystyle k=yx}. k = (-105)(-2) = -210 {\displaystyle k=(-105)(2)=-210}. For - 356 {\displaystyle k=(-35)(6)=-210}. For - 2110 {\displaystyle k=(-105)(2)=-210}. For - 356 {\displaystyle k=(-105)(2)=-210}. For - 210 (displaystyle k=(-21)(10)=-210}. For - 15 14 (displaystyle 5) minutes and complete the 100-yard dash will go 30 (displaystyle 30) feet in 5 (displaystyle 5) minutes and complete the 100-yard dash so distance is the y {\displaystyle y} variable and time is the x {\displaystyle x} variable. You've been told that Flash goes 6 {\displaystyle 6} ($k = 6 \ 1 = 6 \ (k = 6 \ ($ minutes, use the equation for direct proportionality, $y = k x \{ displaystyle y = (6)(5) = 30 \}$. To find out how long it will take Flash to complete the 100-yard (300 feet) dash, use the same equation, but solve for x {\displaystyle x} instead. Start with 300 = 6 x {\displaystyle 300=6x}, then divide each side by 6 {\displaystyle 28} miles to the gallon. The numbers for gallons of gas aren't in sequential order, but if you shuffle them around, you see that the values for both gas and miles driven are increasing—so this is a direct proportionality problem. The number of miles you drive depends on the gallons of gas you have in your car, so miles driven is the y {\displaystyle y} variable. Now, all you need to do is plug those values into the equation for direct proportionality: k = 224 8 = $28 \$ Advertisement 1 Plot the points on a graph and draw a line through the points. If the line you drew crosses the origin of the graph, the points have a proportional relationship. But if the line have a proportional relationship bet if the line you drew crosses the origin of the graph, the points have a proportional relationship. But if the line have a proportional relationship bet if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relationship. But if the line you drew crosses the origin of the graph and draw a line through the points have a proportional relation the points have a proporti doesn't go through the origin, the points are not proportional. When graphing ratios, the first number (or numerator of a fraction) is the x {\displaystyle x} coordinate.[7] 2 Find the constant of proportionality for each ratio. If any of the ratios in the set has a different constant of proportionality than the others, the ratios in the set are not proportional. But if all of the ratios have the same constant of proportionality, then they are proportional. Remember to use k = y x {\displaystyle k={\frac {y}{x}}} if the values of both variables go up and k = y x {\displaystyle k=yx} if the value of one variable goes up and the other goes down. Advertisement Ask a Question Advertisement Thanks for reading our article! If you'd like to learn more about math, check out our in-depth interview with JohnK Wright V. Co-authored by: Texas Certified Math Teacher This article was co-authored by interview with JohnK Wright V. Co-authored by: Texas Certified Math Teacher This article was co-authored by JohnK Wright V. Co-authored by: Texas Certified Math Teacher This article was co-authored by: Texas Certified Math Te Wright V is a Certified Math Teacher at Bridge Builder Academy in Plano, Texas. With over 20 years of teaching experience, he is a Texas SBEC Certified 8-12 Mathematics Teacher. He has taught in six different schools and has taught pre-algebra, algebra 2, pre-calculus, statistics, math reasoning, and math models with applications. He was a Mathematics Major at Southeastern Louisiana and he has a Bachelor of Science from The University of the State of New York (now Excelsior University) and a Master of Science in Computer Information Systems from Boston University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University of the State of New York (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) and a Master of Science from The University (now Excelsior University) (now Excelsior Un Views: 17,182 Categories: Mathematics Print Send fan mail to authors Thanks to all authors for creating a page that has been read 17,182 times. Find the constant of proportionality using the equation $k = y x \{ displaystyle \ k = \{ rac \{y\} \} \}$ using the equation $k = y x \{ displaystyle x \}$ when ratios are inversely proportionality to determine what value $y \{ displaystyle x \}$ so you can graph the coordinates. The constant of proportionality is the rate at which the x and y variables change. In other words, this is a constant slope. When two variables are proportional, that means they both change at the same rate. If you plot them on a graph, you can draw a straight line between all of the points that goes through the origin of the graph. The constant of proportionality is the slope of that line.[1] Graphed coordinates (x, y) {\displaystyle (x, y) { as the independent variable, since y {\displaystyle y}. You can also think of x {\displaystyle y}. The independent variable and y {\displaystyle y}. The independent variable and y {\displaystyle x}. The independent variable and y {\displaystyle y}. The independent variable and y {\displaystyle y} as the independent variable and y {\displaystyle y}. constant of proportionality can never be 0 {\displaystyle 0}. Advertisement 1 Direct proportionality: If two variables both increase at the same rate, they have a direct proportionality is represented by the equation $y = k x {\displaystyle y = kx}$ where k {\displaystyle k} is the constant of proportionality. The same equation can also be written $k = y x \{ displaystyle d = rt \{ displaystyle d = rt \} \}$. Use this version if you're trying to find the constant of proportionality and already have the values for the two variables. The formula $d = rt \{ displaystyle d = rt \} \}$. constant of proportionality. 2 Inverse proportionality is represented by the equation $y = k x \{ displaystyle k \}$ where k $\{ displaystyle k \}$ where k $\{ displaystyle k \}$ where k $\{ displaystyle k \}$ is the constant of proportionality. [2] The same equation can also be written $\{ displaystyle k \}$ where k $\{ displaystyle k \}$ is the constant of proportionality. k = y x {\displaystyle k=yx}. Use this version to find the constant of proportionality when you already have the values for the other two variables. Advertisement 1 Set up each ratio as a fraction. In a ratio, the first number is the denominator of the fraction and the second number is the numerator. On a graph, the x {\displaystyle x} coordinate of any point is the denominator, while the y {\displaystyle (2,40)}, and (12,60)} are the same as the ratios 20:4 {\displaystyle (2,20)}, (8,40)}, and (12,60)} are the same as the ratios 20:4 {\displaystyle (2,20)}, (8,40)}, and (0:12 {\displaystyle (0:12}. As fractions, they are 20 4 {\displaystyle {\frac {20}{4}}, 40 8 {\displaystyle {\frac {40}{8}}, and 60 12 {\displaystyle {\frac {60}{12}}. 2 Determine whether you're looking at direct or inverse proportionality. Look at the numbers in the set of ratios you've been given. If they all increase, they're directly proportional. On the other hand, if one set of values increases and the other set of values decreases, you've got inverse proportionality. For example, look at the set 20 4 {\displaystyle {\frac {20}{4}}}. In each ratio, the values of the numerator and the denominator both increase, so you're looking at direct proportionality. What if you had 1 12 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle {\frac {3}{4}}}? The values of the numerator increase, so you're looking at inverse proportionality. 3 Plug the values of the ratios have direct proportionality, use the equation $k = y x \{ displaystyle k = 1 \}$. For inverse proportionality, use the equation $k = y x \{ displaystyle k = 1 \}$. For inverse proportionality, use the equation $k = y x \{ displaystyle k = 1 \}$. For inverse proportionality, use the equation $k = y x \{ displaystyle k = 1 \}$. $\{20\}\{4\}=5\}$. Your constant of proportionality is 5 {\displaystyle 5}. What about the inverse set? Take the ratio 1 12 {\displaystyle 12}. 4 Check = (1)(12) = 12 {\displaystyle k=yx} to get k = (1)(12) = 12 {\displaystyle k=yx} to get k = (1){(12)}=12 {\displaystyle k=yx} to get k = (1){(1 your work with the other ratios. If the ratios are proportional, the constant of proportionality will be the same for all of them. If any of them are different, then the ratios aren't proportionality. Try this on your own with the ratios aren't proportionality. Try this on your own with the ratios aren't proportionality will be the same for all of them. If any of them are different, then the ratios aren't proportionality will be the same for all of them. If any of them are different, then the ratios aren't proportionality. {8}}}, and 60 12 {\displaystyle {\frac {60}{12}}}. You'll see that you get 5 {\displaystyle 5} for each ratio, which tells you this ratios are indeed directly proportional. For example, in the set 1 12 {\displaystyle {\frac {1}{12}}}, 2 6 {\displaystyle {\frac {2}{6}}}, and 3 4 {\displaystyle {\frac {3}{4}} , plugging each ratio into the equation k = y x {\displaystyle k=yx} gets you a constant of 12 {\displaystyle 12} for each ratio, so they are inversely proportionality, you can figure out what the values of yath a constant of proportional to for each ratio into the equation k = y x {\displaystyle 12} for each ratio into the values in the series using the constant of proportionality. {\displaystyle y} would be for any value of x {\displaystyle x} is 7 {\displaystyle y = kx {\displaystyle y = (7)(5) = 35 {\displaystyle y = (7)(5) = 35 {\displaystyle y = (7)(5) = 35 }. Use the equation y = k x {\displaystyle y={\frac {k}{x}} if the set of ratios is inversely proportional. If x {\displaystyle 12}, y {\displaystyle 3} (y = 12 4 = 3 {\displaystyle 3} (y = 12 4 = 3 {\displaystyle 12}, y {\displaystyle 3}). Advertisement 1 Find the constant of proportionality is 12 {\displaystyle 4} and the constant of proportionality is 12 {\displaystyle 3} (y = 12 4 = 3 {\displaystyle 4} = 3 {\displaystyle 4} = 3 {\displaystyle 4} = 3 {\displaystyle 4} = 3 {\displaystyle 3} (y = 12 4 = 3 {\displaystyle 4} = 3 {\di for 105 - 2 {\displaystyle {\frac {-15}{14}}, -21 10 {\displaystyle {\frac {-15}{14}}, -21 10 {\displaystyle {\frac {-21}{10}}, -35 6 {\displaystyle {\frac {-21}{10}}, -21 10 {\displaystyle {\frac {-15}{14}}, -21 10 {\displaystyle {\frac {-21}{10}}}, -21 10 {\displaystyle {\frac {-15}{14}}}, -21 10 {\displaystyle {\frac {-21}{10}}} k=yx}. 3 The slowest mammal in the world, the sloth, moves at a rate of 6 {\displaystyle 6} feet per minute. How far will Flash to complete the 100-yard dash? Hint: 100 yards is 300 feet. 4 You're on a road trip. Each time you get gas, you record the number of miles you drove and the amount of gas your car used: 224 {\displaystyle 224} miles on 8 {\displaystyle 280} miles on 10 {\displaystyle 280} miles on 4 {\displaystyle 280} miles on 10 {\displaystyle 224} miles on 4 {\displaystyle 280} miles on 10 {\displaystyle 280} miles on 4 {\displaystyle 280} miles on 4 {\displaystyle 280} miles on 10 {\displaystyle 280} miles on 4 {\displ so you're looking for the constant of proportionality here. Advertisement 1 The constant of proportionality is 7 {\displaystyle 7}. If you remember your multiplication tables, you know that 14 2 {\displaystyle 7}. If you remember your multiplication tables, you know that 14 2 {\displaystyle 7}. If you remember your multiplication tables, you know that 14 2 {\displaystyle 7}. in the set, you find that both 10.5 1.5 {\displaystyle {\frac {10.5}}} and 24.5 3.5 {\displaystyle {\frac {24.5}} also simplify to 7 {\displaystyle 7} , so that's your answer. Since all the ratios in the set have the same constant and the values are all increasing, you also know that this series is directly proportional. 2 The constant of proportionality is - 210 {\displaystyle -210}. Since the y {\displaystyle k} using the equation k = y x {\displaystyle k=yx}. Before you even start multiplying, you can already tell that each of the ratios is going to simplify to a negative number. All that's left is to multiply each ratio to see that they all simplify to $-210 \left(\frac{105}{2}\right)$, $k = (-105)(-2) = -210 \left(\frac{105}{2}\right)$, $k = (-105)(2) = -210 \left(\frac{105}{2}\right)$, $k = (-105)(2) = -210 \left(\frac{105}{2}\right)$, $k = (-105)(2) = -210 \left(\frac{105}{2}\right)$ For -356 {\displaystyle {\frac {-21}{10}}, k = (-35)(6) = -210 {\displaystyle k=(-21)(10) = -210 {\displaystyle k=(-15)(14) = -210 {\displaystyle k=(-21)(10) = -210 {\displa have the same constant of proportionality, they are inversely proportional. 3 Flash will go 30 {\displaystyle 5} minutes. Start this problem by finding the constant of proportionality. You know you're going to be working with directly proportionate ratios because the more minutes pass, the further Flash will go, so you use the equation $k = y x \{ displaystyle x \}$. The distance Flash goes 6 $\{ displaystyle x \}$. The distance Flash goes 6 $\{ displaystyle x \}$. minute, so that makes his constant of proportionality 6 {displaystyle 5}. To find how far Flash will go in 5 {displaystyle 5}, so your answer is 30 {displaystyle 30} (y = k x(6)(5) = 30 {\displaystyle y=(6)(5)=30}). To find out how long it will take Flash to complete the 100-yard (300 feet) dash, use the same equation, but solve for x {\displaystyle 30] = 6 x {\displaystyle 300=6x}, then divide each side by 6 {\displaystyle 6} to get your answer, 50 {\displaystyle 50}. 4 Your car gets 28 {\displaystyle 28} miles to the gallon. The numbers for gallons of gas aren't in sequential order, but if you shuffle them around, you see that the values for both gas and miles driven are increasing—so this is a direct proportionality problem. The number of miles you drive depends on the gallons of gas you have in your car, so miles driven is the y $\left(\frac{224}{8}\right) = 28 \ k = 224 \ k = 280 \ 10 = 28 \ b = 28 \ b = 28 \ k = 280 \ 10 = 28 \ k = 280 \ 10 = 28 \ k = 112 \ 4 = 28 \ b = 28 \ k = 112 \ 4 = 28 \ b = 28 \ k = 112 \ 4 = 28 \ b = 28$ Advertisement 1 Plot the points on a graph and draw a line through the points. If the line you drew crosses the origin, the points are not proportional. When graphing ratios, the first number (or numerator of a fraction) is the y {\displaystyle y} coordinate and the second number (or denominator of a fraction) is the x {\displaystyle x} coordinate.[7] 2 Find the constant of proportionality than the others, the ratios in the set are not proportionality for each ratio. If any of the ratios in the set are not proportionality than the others, the ratios in the set are not proportionality for each ratio. then they are proportional. Remember to use $k = y x \{ displaystyle k = yx \}$ if the values of both variables go up and $k = yx \{ displaystyle k = yx \}$ if the value of one variable goes up and the other goes down. Advertisement Ask a Question Advertisement Ask a Question Advertisement Thanks for reading our article! If you'd like to learn more about math, check out our indepth interview with JohnK Wright V. Co-authored by: Texas Certified Math Teacher This article was co-authored by JohnK Wright V is a Certified Math Teacher at Bridge Builder Academy in Plano, Texas. With over 20 years of teaching experience, he is a Texas SBEC Certified 8-12 Mathematics Teacher. He has taught in six different schools and has taught pre-algebra, algebra 1, geometry, algebra 2, pre-calculus, statistics, math reasoning, and math models with applications. He was a Mathematics Major at Southeastern Louisiana and he has a Bachelor of Science from The University of the State of New York (now Excelsion University) and a Master of Science in Computer Information Systems from Boston University. This article has been viewed 17,182 times. Co-authors: 7 Updated: January 31, 2025 Views: 17,182 Categories: Mathematics Print Send fan mail to authors for creating a page that has been read 17,182 times. Wei Bin LooWei Bin is a Product Manager based in London, leading a technology company's Product and Data functions. With a keen focus on delivering top-notch technology solutions, Wei Bin empowers businesses to unlock their full potential through innovative products, data-driven insights, and an unwavering commitment to customer value. His passion lies in guiding companies toward growth and success, leveraging the power of technology, data, and customer-centric product solutions. At Omni, Wei Bin leverages his financial tools aimed at helping people improve their financial literacy. Outside of his professional pursuits, Wei Bin is an avid wine enthusiast with extensive knowledge and certification in the field. He also enjoys the strategic challenges of chess and poker, as well as swimming in his leisure time. See full profileCheck our editorial policyAnna Szczepanek, PhDPhD, Jagiellonian University in Kraków, PolandAnna Szczepanek, PhD is a mathematician at the Faculty of Mathematics and Computer Science of the Jagiellonian University in Kraków, where she researches mathematical physics and applied mathematics. At Omni, Anna uses her knowledge and programming skills to create math and statistics calculators. In her free time, she enjoys hiking and reading. See full profileCheck our editorial policy and Adena BennAdena Benn is a Guyanese teacher with a degree in computer science who is always reading and learning. She loves problem-solving, everything tech, and working with teenagers. She has a passion for education and is especially interested in how children learn and the teaching methods that best suit their learning styles. She grew up on a farm in Pomeroon, Guyana, where she worked alongside her parents and siblings. As such, she is just as comfortable growing plants as teaching in the classroom. In her early life, she also gained expertise as a seamstress, which she learned from her mother. By grade 9, she had already acquired her dressmaker's certificate. Today she uses her skills to design many items for her family. In her free time, Adena loves to read, take long walks, write children's stories and poetry, travel, or spend time with her family. See full profileCheck our editorial policy159 people find this calculator helpfulWith this constant of proportionality calculator, we aim to help you to calculate the ratio that relates two dependable given values. The constant of proportionality enables you to understand how the dependent variable changes with the independent variable. We have written this article to help you understand the following: What the constant of proportionality. We will also demonstrate some constant of proportionality examples to help you understand the concept. Let us start with the definition of the constant of proportionality. The constant of proportionality is the ratio that measures the changes of the independent variable. variable changes with the independent variable. The constant of proportionality is the unit rate of a linear relationship. In a graph, the constant of proportionality is also called the slope or the gradient. It is defined as the m within the y = mx + c relationship. Check out our slope calculator and gradient calculator to understand these concepts in linear regression. The constant of proportionality is usually expressed as a fraction or decimal. This is because we calculate the constant of proportionality, let's look at the constant of proportionality example below: Relationship: linear; Independent variable, X: 10; and Dependent variable, X: 10; this example, the X is 10. Determine the dependent variable, Y Next, let's look at the dependent variable for this example is 20. Calculate the constant of proportionality = Y / X The last step is to calculate the metric using the constant of proportionality equation below: constant of proportionality = Y / X. For this example, the constant of proportionality will be 1. You can calculate it by dividing the dependent variable by the independent variable. Yes, the constant of proportionality can be negative. The constant of proportionality will be negative when exactly one of the variables is negative. You can calculate the constant of proportionality in three steps: Determine the independent variable, X. Determine the constant of proportionality in three steps: Determine the constant of proportionality in three steps: Determine the independent variable, X. Determine the constant of proportionality in three steps: Determine the constant of proportionality is the constant of proportionality in three steps: Determine the constant of proportionality is the constant of propor is the same as a slope. They represent the rate of change between the independent and dependent variables. Constant of proportionalityCheck out 45 similar descriptive statistics calculators