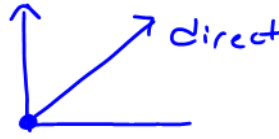


DIRECT vs. PARTIAL VARIATION

<p>Example 1: Stephen works at a hardware store and earns \$9.25 for each hour he works. Let E represent his Earnings, and h represent the number of hours he works.</p> <p style="color: blue; font-size: 1.2em;">$E = 9.25h$</p>	<p>Example 2: Popcorn pops, on average, at a rate of 4 kernels per second. Let P represent the amount of popcorn kernels popped, and s represent the number of seconds.</p> <p style="color: blue; font-size: 1.2em;">$P = 4s$</p>	<p>Example 3: Branley works in sales and earns commission of 2% on the merchandise she sells. Define your variables and write an equation.</p> <p style="color: blue; font-size: 1.2em;">$C = 0.02n$</p>
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These are the examples of direct variation. In example 1, E varies directly with the number of hours. The graph of a direct variation relationship is a straight line through the origin. The equation is in the form $y = mx$



<p>Example 4: Sveta works at a local gym as a personal trainer. She earns \$50 each shift and an additional \$35 per hour of personal training. Let E represent her earnings, and h represent the number of p.t. hours.</p> <p style="color: blue; font-size: 1.2em;">$E = 35h + 50$</p>	<p>Example 5: Matthew's bank account has \$500. Each month he spends \$50. Let B represent his balance, and let m represent the number of months that have passed.</p> <p style="color: blue; font-size: 1.2em;">$B = -50m + 500$</p>	<p>Example 6: Josie repairs computer problems and charges a \$50 service fee plus \$30 per hour. Let F represent her total fee, and h represent the number of hours worked.</p> <p style="color: blue; font-size: 1.2em;">$F = 30h + 50$</p>
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These are the examples of partial variation. In example 5, B varies partially with the number of months. The graph of a **partial variation** relationship is a straight line that starts from any point on "y" axis. The equation is in the form $y = mx + b$



Situation	Equation	D or P
a) A cookie recipe makes 12 cookies for each egg in the recipe.	$R = 12n$	D
b) An airplane was at an altitude of 1700m and is descending at 50m per minute.	$A = -50t + 1700$	P
c) Michael works as a tree planter for the government. He can plant 900 trees in a day.	$T = 900d$	D
d) A cell phone plan is \$20 per month but excludes text messaging. Each text message costs 20 cents.	$C = 0.20t + 20$	P
e) Leah cuts lawns in the summer and earns \$15 for every lawn she cuts.	$W = 15L$	D
f) A banquet hall charges \$500 for the hall rental and \$32.50 per person.	$C = 32.5p + 500$	P

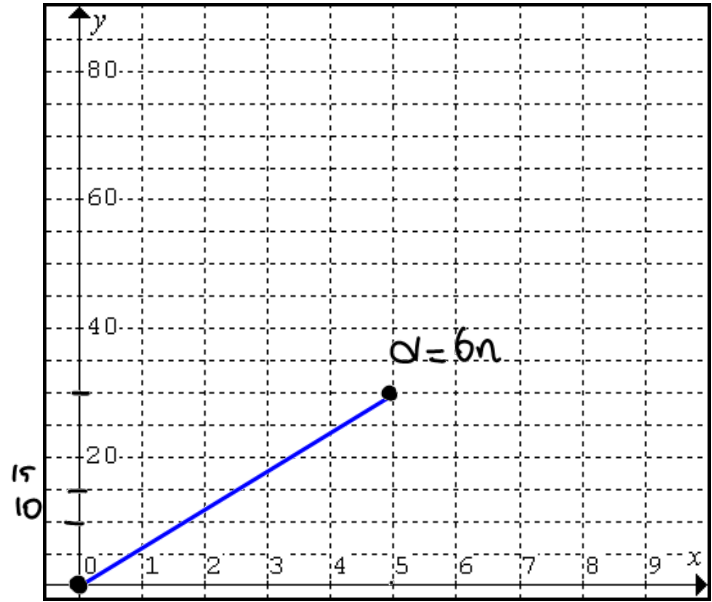
DIRECT VARIATION

Example 1

The new Mazda 3 Sport has gas mileage of 6km per litre. This can be modelled by the algebraic equation $d=6n$, where d represents the distance you can travel and n represents the number of litres you use.

Complete the table of values for the distance per number of litres and use your table to create a graphical model of this scenario.

n	d = 6n
0	$6(0) = 0$
1	$6(1) = 6$
2	$6(2) = 12$
3	$6(3) = 18$
4	$6(4) = 24$
5	$6(5) = 30$



Example 2

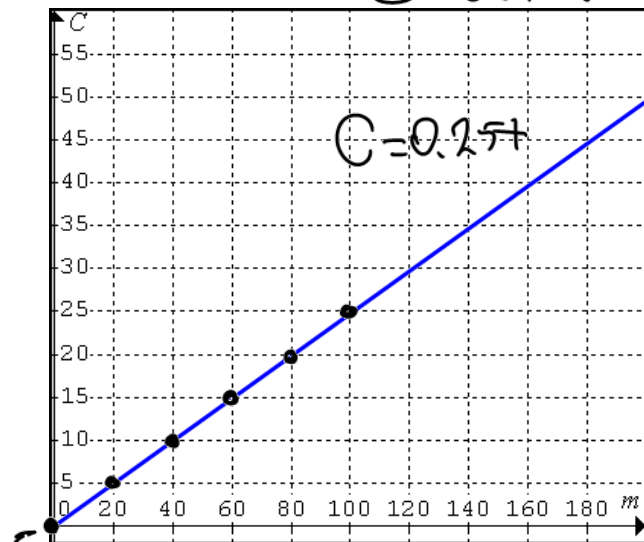
Dooko Mobile Company does not charge any monthly fees, but charges \$0.25 per minute of cell phone use. Model this scenario algebraically.

$$C = 0.25t$$

Create a table of values using your equation and create a graphical model.

DIRECT VARIATION

t	C = 0.25t
0	$0.25(0) = 0$
20	$0.25(20) = 5$
40	$0.25(40) = 10$
60	$0.25(60) = 15$
80	$0.25(80) = 20$
100	$0.25(100) = 25$



starts from origin

PARTIAL VARIATION

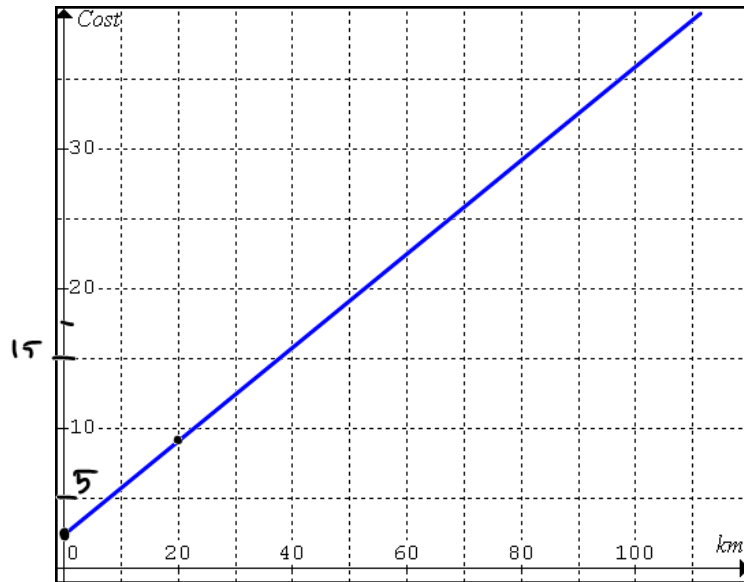
Example 1

A taxi company charges a flat rate of \$2.50 plus \$0.35/km. The cost can be found using the equation $C = 0.35k + 2.5$, where C represents the cost and k represents the number of kilometres.



Using the equation, complete a table of values. Using your table of values, create the graph.

k	$C = 0.35k + 2.5$
0	$0.35(0) + 2.5 = 2.5$
20	$0.35(20) + 2.5 = 9.5$
40	$0.35(40) + 2.5 = 16.5$
60	$0.35(60) + 2.5 = 23.5$
80	$0.35(80) + 2.5 = 30.5$
100	$0.35(100) + 2.5 = 37.5$



Example 2

KeDe Mobile Company charges \$20 per month and an additional \$0.25 per minute of long distance calls. Model this scenario algebraically.

$$C = 0.25t + 20$$

Create a table of values using your equation and create a graphical model.

t	$C = 0.25t + 20$
0	$= 0.25(0) + 20 = 20$
20	$= 0.25(20) + 20 = 25$
40	$= 0.25(40) + 20 = 30$
60	$= 0.25(60) + 20 = 35$
80	$= 0.25(80) + 20 = 40$
100	$= 0.25(100) + 20 = 45$

