Constant of Proportionality Notes

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| What is a constant of proportionality? | The constant value of the ratio of two proportional quantities.  Also is classified as the unit rate. |
| How to identify the constant of proportionality? | You can identify the constant of proportionality in tables, graphs, equations and other proportional relationships.  \*Recall how to compute the unit rate. Use those same strategies to find the constant of proportionality. |
| Example 1: Tables | Analyze the table.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | number of pens (p) | 3 | 5 | 8 | 10 | 15 | | Cost (C) | $6 | $10 | $16 | $20 | $30 |   What is the cost of 1 pen?  \*The cost of 1 pen is $2. 2 is the constant of proportionality because it is the constant value of the ratio between the number of pens and the cost.  \*The equation can be written as C = 2p, which represents the total cost (C) equals 2 dollars times the number of pens (p) purchased. |
| Example 2: Graphs | Using the graph, determine the constant of proportionality.    To determine the constant of proportionality, find the unit rate. To find the unit rate, look where the Length is 1 unit. What is the Lateral Surface Area when the Length is 1?  \*4 is the constant of proportionality. If you follow the ratio, the constant is 4 because 1:4, 2:8, 3:12, and etc.  \*The equation for this would be A = 4L meaning the area (A) equations 4 times the length (L). |
| Example 3: Equations | Since we know that proportional equations contain only multiplication or division, use the coefficient to identify the constant of proportionality.   1. The amount of sales tax paid on an item is proportional to the cost of the item. If the sales tax rate is 7%, then the amount of the sales tax (t) is .07 times the cost (c) of the item. The equation is t = .07c can be used to determine the amount of sales tax. What is the constant of proportionality?   \*The constant is .07 or 7% since that is the coefficient of the equation. |
| Example 4: Verbal Descriptions | In probability, the chance to roll a 1 when rolling a number cube is. In the long run, the number of times you get a 1 is proportional to the number of times you roll. If you roll 30 times, you would expect to roll a 1 five times. The constant is because it is the constant value of the ratio when comparing the number how many 1s are on a number cube (1:6). |