MPM 1D Handout
Direct and Partial Variation

Date: **Name:**

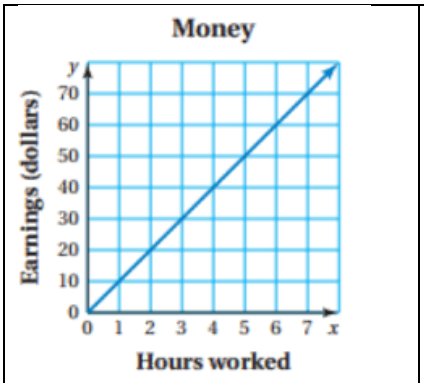
Important Stuff to Remember:

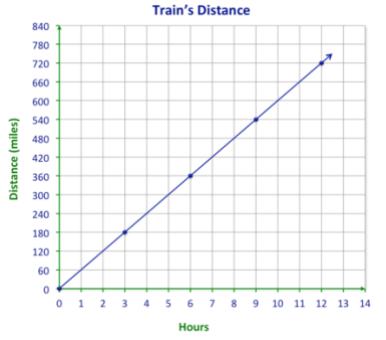
- There are FOUR ways to represent a relation:
  - Words (description)
  - Equation
  - Table
  - Graph
- We need to identify direct and partial variation given any one of these forms.

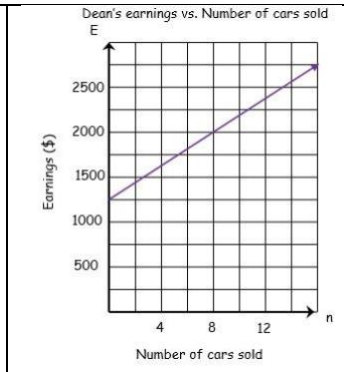
1. Classify each of the equations below as direct or partial variation. Justify your answer.
   a. $y = 5x$ b. $C = 10n + 200$ c. $P = 0.25n$

2. For each equation in question one, state the initial value for the relation and the rate of change.

3. Classify each of the graphs shown below as direct or partial variation. Justify your answer.







4. For each graph, in question 3, state the initial value for the relation and the rate of change.

5. Classify each of the descriptions below as direct or partial variation. Justify your answer.
    a. A class is planning a field trip to an art gallery. The cost of renting a bus is $250. There is an additional cost of $4 per student to enter the gallery.

    b. At the surface of a lake, a scuba diver experiences 102.4 kPa of pressure. As the diver descends, the pressure increases by 101.3 kPa for every 10 m.

    c. The price of oranges is $2.25 per kilogram.

6. For each of the descriptions in question 5, state the initial value for the relation and the rate of change.

7. Classify each of the following tables as direct or partial variation. Justify your answer.

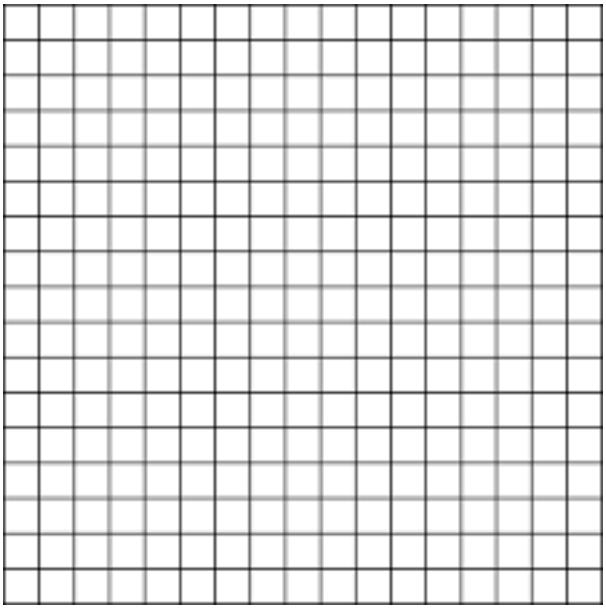
Time (h)	Volume (L)
0	42
1	38
2	34
3	30
4	26

Time, t, in hours	*Distance* $D = 30t$
0	0
1	30
2	60
3	90
4	120

8. For each table in question 7, state the initial value for the relation and the rate of change.

9. A parking garage charges $2.75 per hour for parking.
    a. Describe the relationship between the cost of parking and the time, in hours, parked.

    b. Illustrate the relationship graphically and represent it with an equation.



    c. Use your graph to estimate the cost for 7 hours of parking.

    d. Use your equation to determine the exact cost for 7 hours of parking.

10. At his summer job, Sam's regular wage is $9.50 per hour. For any overtime, Sam earns 1.5 times his regular wage.
    a. Write an equation representing Sam's regular pay.

    b. Write a separate equation representing Sam's overtime pay.

    c. Sam gets a raise to $10 per hour. How does this change the equations?

11. A small pizza costs $7.00 plus $1.50 per topping.
    a. Identify the fixed cost and the variable cost for this relation.

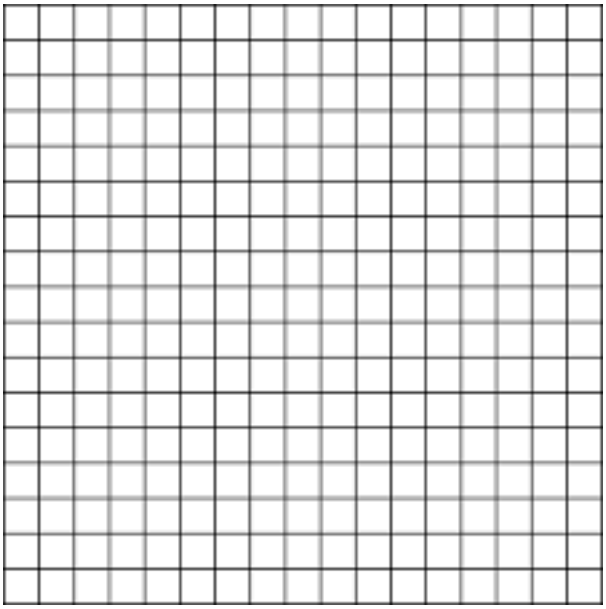
b. Write an equation relating the cost of a pizza, C, to the number of toppings, n.

c. Use the equation to determine the cost of a small pizza with four toppings.

12. A fitness club offers two types of monthly memberships:
    - Membership A: $4 per visit
    - Membership B: a flat fee of $12 plus $2 per visit

a. Complete the table and graph both memberships for 0 to 10 visits.

# of Visits	0	2	4	6	8	10
Cost for A		8				40
Cost for B	12			24		



b. Classify each relation as a direct variation or a partial variation.

c. Write an equation relating the cost and the number of visits for each membership.

d. Compare the monthly membership costs. When is membership A cheaper than membership B?