9D Unit3 Survival Guide   Modelling Relations   Name: _____
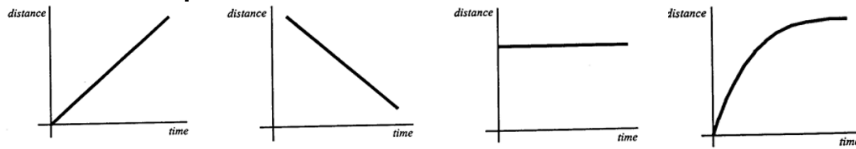
Distance-Time Graphs

- start at distance ___ units from reference point
- move _____ at a_____ pace for _____ units of time covering ___ units of dist.

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Differences
-Find all differences in x-values

$$\triangle x = next - previous = x_2 - x_1$$

-If differences are constant, proceed. If not, can't do analysis without ignoring points that cause the problem.
-Find all differences in y-values

$$\triangle y = next - previous = y_2 - y_1$$

Linear
-The differences in both x and y values remain constant throughout data
-Slope must be constant for the relation to be a straight line.

Non Linear
The differences are not constant throughout the data

SLOPE or RateOfChange or ConstantOfVariation
-The measure of the inclination of the line
-*Montée* is word for climb in French, so we will use a letter m

For word problems:
-look for ROC #
"per"   ex. $\$/hr$
"every"
"each"

For table of values or for 2 points (x_1, y_1) and (x_2, y_2):

$$m = \frac{\Delta y}{\Delta x} \quad \text{or}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

* Δ is Greek letter 'delta'
Here used for 'change in'

For graphs:
-choose 2 points on crosshairs of the grid
-watch the scale, don't just count the squares

$$m = \frac{rise}{run}$$

*careful, y is first, not like plotting points where x is first

For equations:
-if y is isolated, then slope is the coefficient on the variable

Initial Value or Y-INT
-The starting amount of the dependent variable, y
-Specific y-int, not a general point that varies, so we will use a letter b

For word problems:
-look for initial value "flat fee" "start at"

For table of values
-look for the y-intercept point with $x = 0$

For graphs:
-look for a point on the y-axis

For equations:
-if y is isolated, then y-int is the constant term without the variable
-if y is NOT isolated, sub x=0 and solve

Equation for a Line
(slope y-intercept form)

$$\boxed{y = mx + b}$$

Direct Variation
-A relation in which one variable is a multiple of the other
-No flat fee or initial cost
-Point (0,0) is part of table or graph
-Equation looks like $y = mx$

Indirect Variation
-A relation in which one variable is a multiple of the other PLUS a constant amount
-HAS flat fee or initial cost
-Point (0,0) is NOT part of table or graph
-Equation looks like

$$y = mx + b$$

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4 Ways to Represent

Description		Equation	

Table

Games rented	Cost ($)

Graph

Description
You work at a store selling shoes. You get 10% commission on all your sales.

Equation

Table

Sales ($)	Earnings ($)

Graph

Description

Equation

Table

Time (min)	Temp. (°C)
4	9
6	8
10	
	3

Graph