Graphing

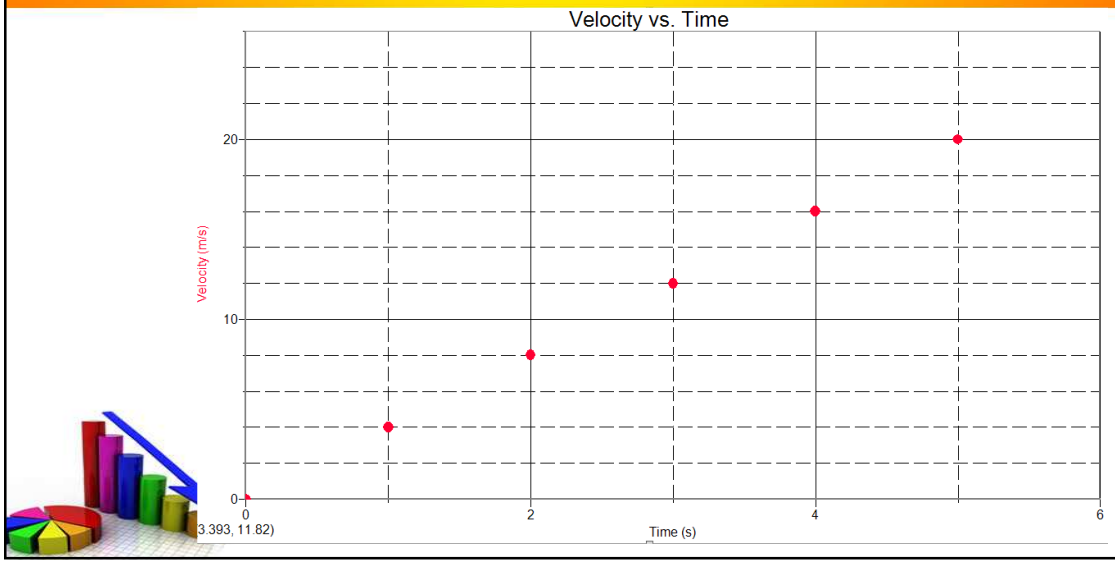
1

Why Graph?

- In general, graphs combine data into clearly visible relationships.
- These relationships also help us predict the results of other situations, not yet tested.
- For example:

2

What was the car's speed at 2.5 seconds?
What would it be at 6 seconds?



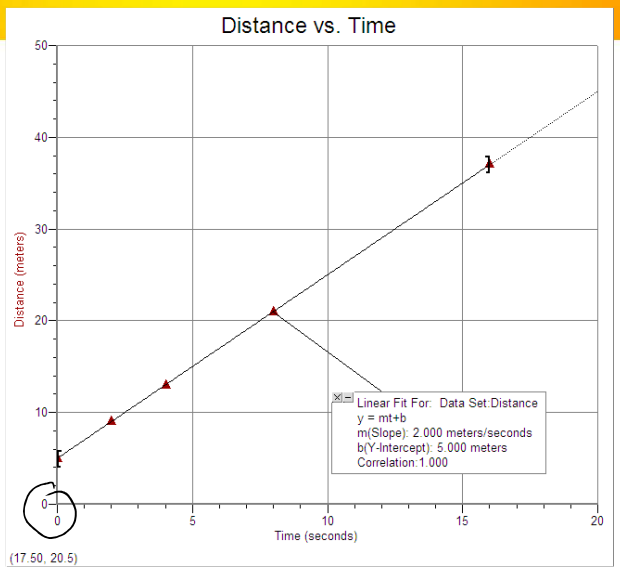
3

Parts of a Graph

- When grading graphs, I will look for:
  - Axes
  - Labels (Units)
  - Title Y vs. X
  - Data Points
  - Best Fit Line or Curve
  - Orientation (SIZE)

4

Using Graphical Analysis



5

Axes & Variables

- X-Axis
  - Independent Variable:

WE CHANGE/CONTROL

- Y Axis
  - Dependent Variable:

CHANGES BECAUSE

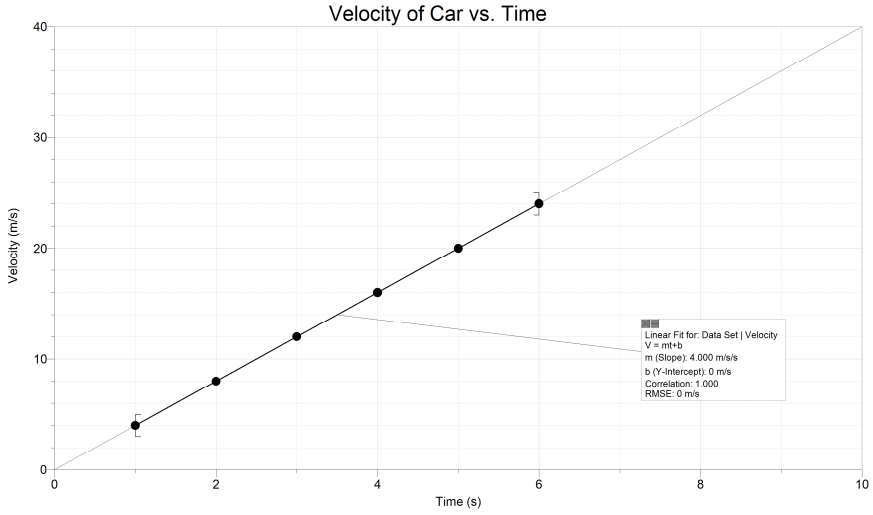
6

Variable Relationships - Generalizations

- Direct Relationships
  - As one variable increases, the other increases
  - As one variable decreases, the other variable decreases
- Inverse/Indirect Relationships
  - As one variable increases, the other decreases
  - As one variable decreases, the other variable increases

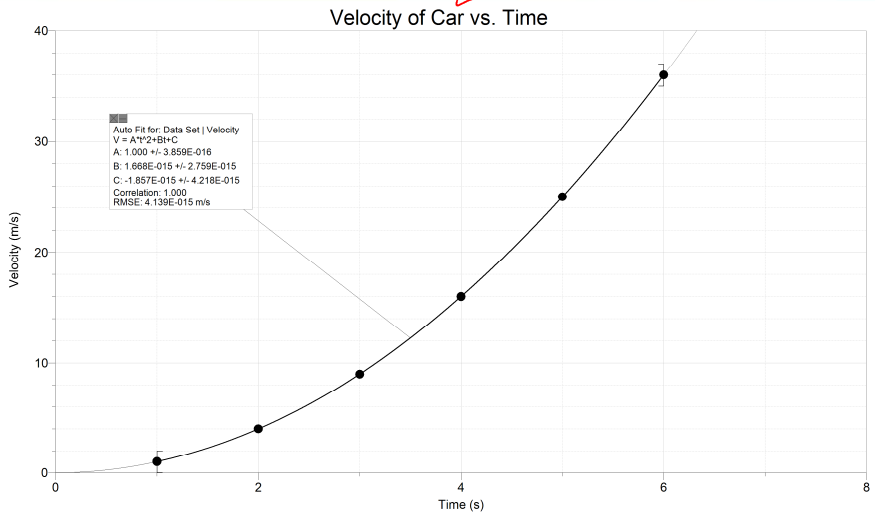
Variable Relationships

Linear: $y = mx + b$



Variable Relationships

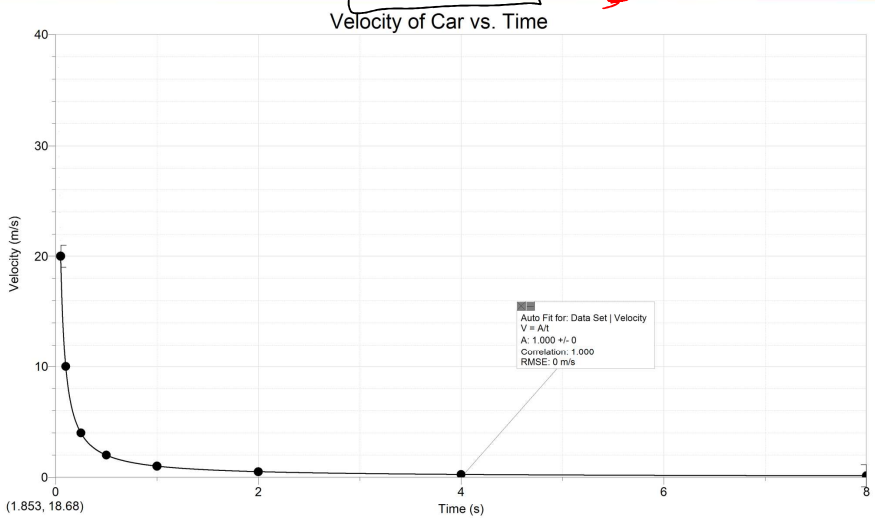
Quadratic: $y = Ax^2 + Bx + C$



9

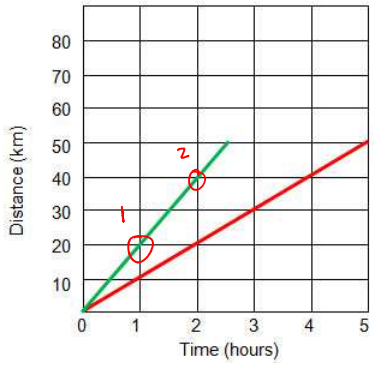
Variable Relationships

Inverse: $y = A/x$



10

Finding Slope



- Equation:

$$\frac{Y_2 - Y_1}{X_2 - X_1} = \frac{\Delta Y}{\Delta X} = \frac{\text{RISE}}{\text{RUN}}$$

- Find the slope of the green line:

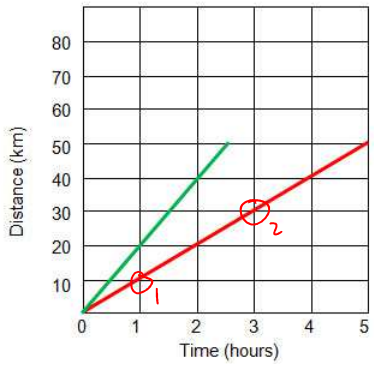
$$\frac{Y_2 - Y_1}{X_2 - X_1} = \frac{40 - 20}{2 - 1} = \frac{20\ \text{KM}}{1\ \text{HR}} = 20\ \text{KM/HR}$$

- What is the unique equation of the line? $Y = MX + B$

$$Y = 20X + 0$$

11

Finding Slope



- Equation:

$$\frac{Y_2 - Y_1}{X_2 - X_1}$$

- Find the slope of the red line:

$$\frac{30 - 10}{3 - 1} = \frac{20\ \text{KM}}{2\ \text{HR}} = 10\ \text{KM/HR}$$

- What is the unique equation of the line? $Y = 10X + 0$

12