

2.2 Linear Functions and Models

Linear Function: $f(x) = mx + b$ (slope-intercept form)

Graph 2 ways:

- 1) Plot y-int and move by the slope
- 2) make an x/y chart and plot the points

Straight line depreciation

Book value - the value of an asset that a company uses to create its balance sheet. Some companies will depreciate their assets using straight line depreciation so that the value of the asset declines by a fixed amount each year.

Ex. 1 Suppose a company purchased a fleet of new cars for its sales force at a cost of \$28,000 per car. They choose to depreciate each vehicle using the straight line method over 7 years. This means each car will depreciate by

- a) Write a linear function that expresses the book value of each car as a function of its age

b) graph linear function

c) What is the book value after 3 years?

Direct Variation: $y=kx$ (linear function)

Read "y varies directly with x" or "y is directly proportional to x"

k is the constant

x is the independent variable

y is the dependent variable

Ex. 2 A monthly payment (P) on a mortgage varies directly with the amount borrowed (B). If the monthly payment on a 30 yr. mortgage is \$6.65 for every \$1000 borrowed, find a formula that relates the monthly payment to the amount borrowed. Then find monthly payment when \$120,000 is borrowed.

Curve Fitting

Table 5: Data represents the apparent temperature versus the relative humidity in a room with actual temperature of 72 degrees F

<u>Relative humidity</u>	<u>Apparent temperature</u>
0	64
10	65
20	67
30	68
40	70
50	71
60	72
70	73
80	74
90	75
100	76

Ex. 3 Finding equation for linearly related data

a)

b) graph the scatter diagram

c) graph the line found in part a

Line of best fit - the line obtained in the above example depends on the selection of points which would vary slightly depending on which 2 points we choose. It appears to fit the data, but there may be a better fit line

Ex. 4 (ex. 6 pg. 106) use table 5 data

- a) find line of best fit (graph calc)
- b) graph line of best fit in scatter diagram
- c) interpret slope
- d) use line of best fit to predict the apparent temperature of a room with temp. 72 degrees and relative humidity 45%