Booklet 6.2

Unit 6: Linear Relations   Name: _____

6.2 Interpreting Graphs

Prescribed Learning Outcomes (PLO'S):

- Extend a given graph (extrapolate) to determine the value of an unknown element
- Interpolate the approximate value of one variable on a given graph given the value of the other variable
- Extrapolate the approximate value of one variable from a given graph given the value of the other variable   *risky*
- Solve a given problem by graphing a linear relation and analyzing the graph

Terminology

y
x

Dependent Variable: graphed on the vertical axis; e.g. cost
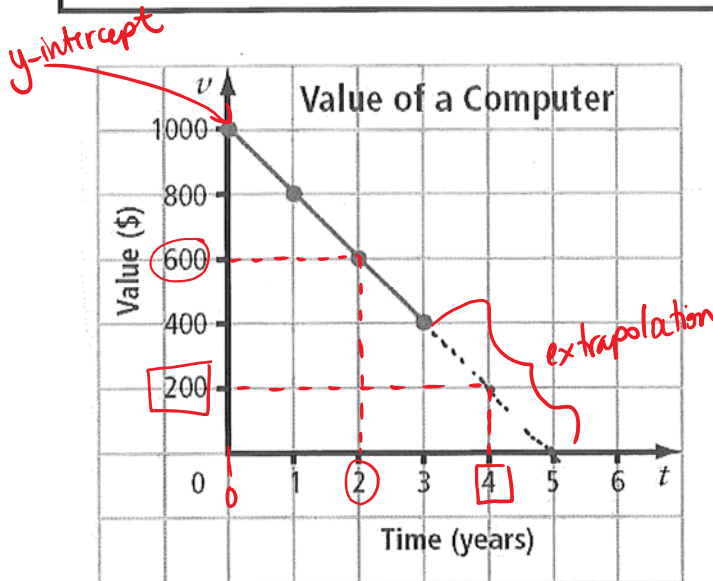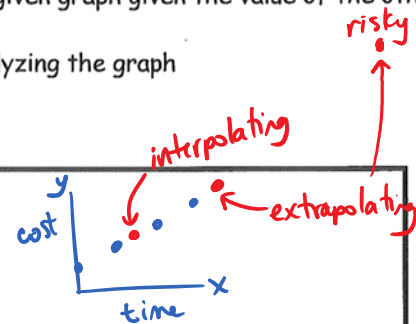**Independent Variable:** graphed on the horizontal axis; e.g. time
Interpolate: estimate a value between two given values
Extrapolate: estimate a value beyond a given set of values
Slope: describes the steepness of a line $m = \dfrac{rise}{run} = \dfrac{y_2 - y_1}{x_2 - x_1}$
y-intercept: Where the graph crosses the y-axis. The x-coordinate is zero

interpolating
cost
extrapolating
time

y-intercept
extrapolation

Value of a Computer

(graph: Value ($) vs Time (years), points at 1000, 800, 600, 400, 200 declining)

1. How much did the computer cost?

   $1000
   (time = 0, when we bought comp)

2. When was it worth $600?

   after 2 years

3. After what approximate period of time does the computer have no value?

   ~ 5 years

4. When is the computer worth approximately $200?

   4 years
   (extrapolating)

INTERPOLATION AND EXTRAPOLATION between and beyond

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<u>Interpolation</u> means to estimate a value BETWEEN two given values.

<u>Extrapolation</u> means to estimate a value BEYOND a given set of values.

Always check to see if it makes sense to do either one of these. For example: 5.35 dollars makes sense, 5.35 people ???   *yes*

no

Example 2: The graph below represents Sally's daily Profit at her pie shop. The horizontal axis represents the number of pies sold and the vertical axis represents the Profit in   dollars.

a) How many pies must Sally sell in one day to break even?

6 pies

b) If Sally has made a profit of $15, how many pies has she sold?

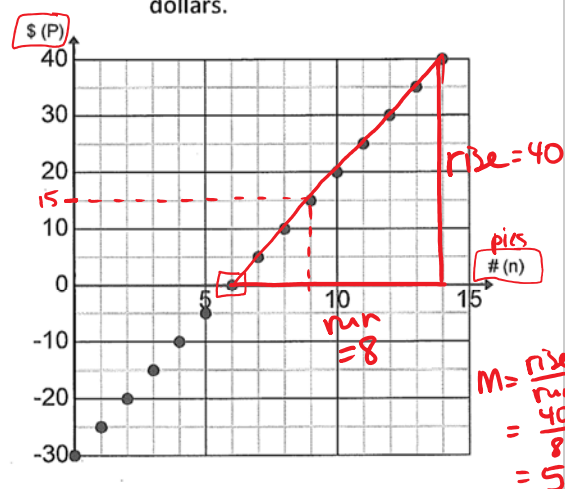*9 pies*

c) How much profit does Sally make on each pie?

slope → $5 — goes up by $5 for each pie

d) What does the y-intercept of -30 mean?

the cost of the supplies ($30)
y-intercept

e) Write a linear equation to represent the graph.

e) If Sally sells 50 pies in one day, what will the profit be?

n = 50
P = ?   *P = 5(50) - 30 = $220*

f) Could the points be connected in this graph? What assumptions are you making?

no, not if she only sells whole pies
or
yes, if she will sell portions of a pie.

rise = 40
pies
 # (n)
run = 8

$$M = \frac{rise}{run}$$
$$= \frac{40}{8}$$
$$= 5$$

$$y = mx + b$$
slope   y-intercept

$$P = 5n - 30$$

OR

d·n	n	P
0	0	-30)+5=d
5	1	-25
10	2	-20
	⋮	⋮

-30

$$dn \pm \sim = P$$
$$5n - 30 = P$$

ASSIGNMENT: P.226 #2, 4, 5, 6, 9, 10, 13, 15, 16ac