1.2 Tables and graphs – Practice exercises

1. My grandfather had \$200 in savings bonds that matured in 1962 when he gave them to me. The bonds continue to earn interest at a fixed rate so I have yet to cash them in. The table shows some values. *Story also appears in 4.1 #3 and 5.3 #1*

year	1962	1970	1980	1990	2000	2010
Y	0	8	18	28	38	48
B	200.00	318.77	570.87	1,022.34	1,830.85	3,278.77

(a) What do Y and B stand for? Include the units and dependence.

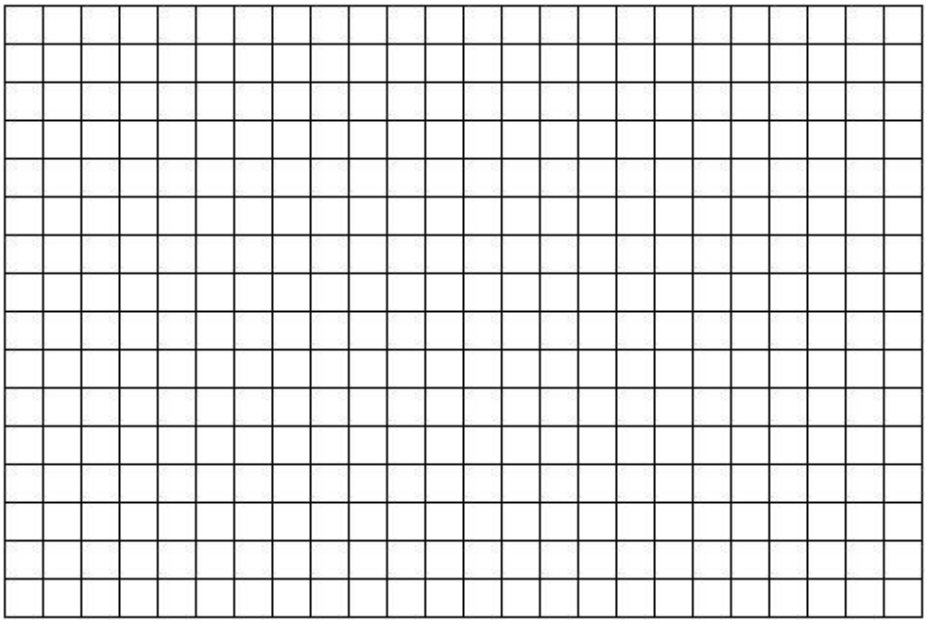
(b) What were the savings bonds worth in 1970?

(c) When were the savings bonds worth \$1,022.34?

(d) Approximately when were the savings bonds worth \$1,500?

(e) What do you expect the savings bonds will be worth in 2020?

(f) Graph the function using the information given in the table.



(g) Use the graph to check your answers to the questions.

2. How cold is it? An air temperature of 10°F is cold but manageable. But add a 30 miles per hour wind and, brrr, it feels like it is -12°F (12 below zero). We say the **wind chill** of 10°F with a 30 mph wind is -12°F. The table lists the wind chill for various wind speeds at an air temperature of 10°F. Source: National Weather Service

Wind (mph)	0	5	10	15	20	25	30	35	40	45	50	55	60
Wind chill (°F)	10	1	-4	-7	-9	-11	-12	-14	-15	-16	-17	-18	-19

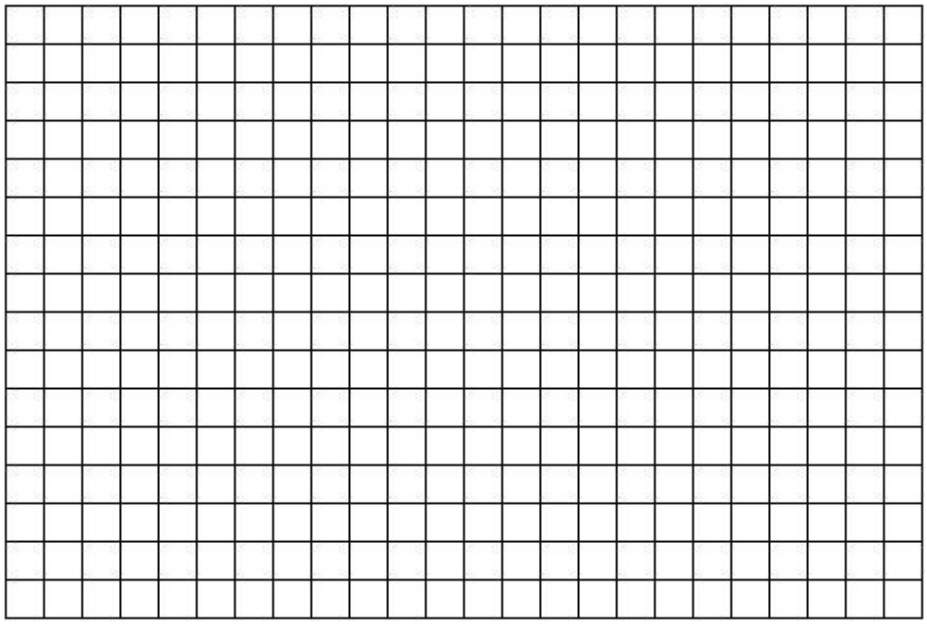
Story also appears in 4.1 #3

(a) At an air temperature of 10°F with a 20 mph wind, what is the wind chill?

(b) A **cold advisory** is issued whenever the wind chill falls below 0°F. How fast does the wind need to be at an air temperature of 10°F to issue a cold advisory?

(c) Between a wind chill of 0°F and -15°F, schools in our district are open but kids may not go outside for recess. What is the corresponding range of wind speeds at an air temperature of 10°F?

(d) Draw a graph showing how wind chill depends on wind speed and use it to check your answers. Extend the vertical axis both above and below the horizontal axis so you can scale for the negative numbers.



3. Anthony and Christina are trying to decide where to hold their wedding reception. The Metropolitan Club costs $1,300 for the space and $92 per person.

Story also appears in 1.3 #2 and 3.2 #3

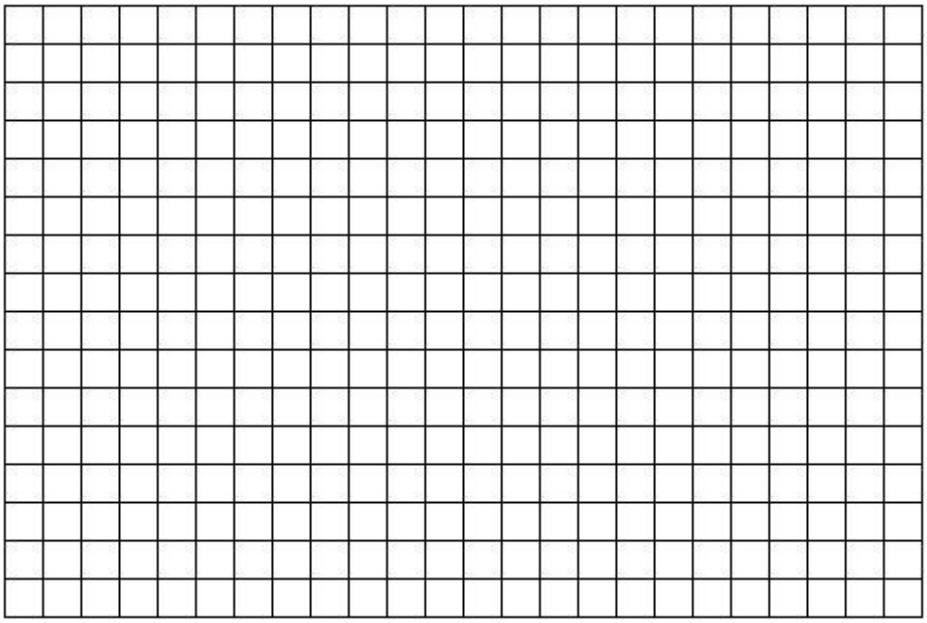
(a) Identify and name the variables, including units.

(b) Explain the dependence using a sentence of the form "___ is a function of ___"

(c) Make a table of showing the cost for 20, 50, 75, 100, or 150 people.

(d) If Tony and Tina's budget is $8,000, how many people can they invite to their wedding reception? Give a rough estimate from your table.

(e) Graph the function.



(f) Does your estimate agree with your graph? If not, revise.

(g) Can you figure out from the story exactly how many guests Tony and Tina can invite to their wedding reception and stay within their $8,000 budget?

4. A mug of coffee costs \$3.45 at Juan's favorite cafe.

Story also appears in 2.1 #4 and 4.2 #2

(a) Juan buys coffee on the way to work every day. How much does Juan spend on coffee in a month? Let's say that's 22 workdays.

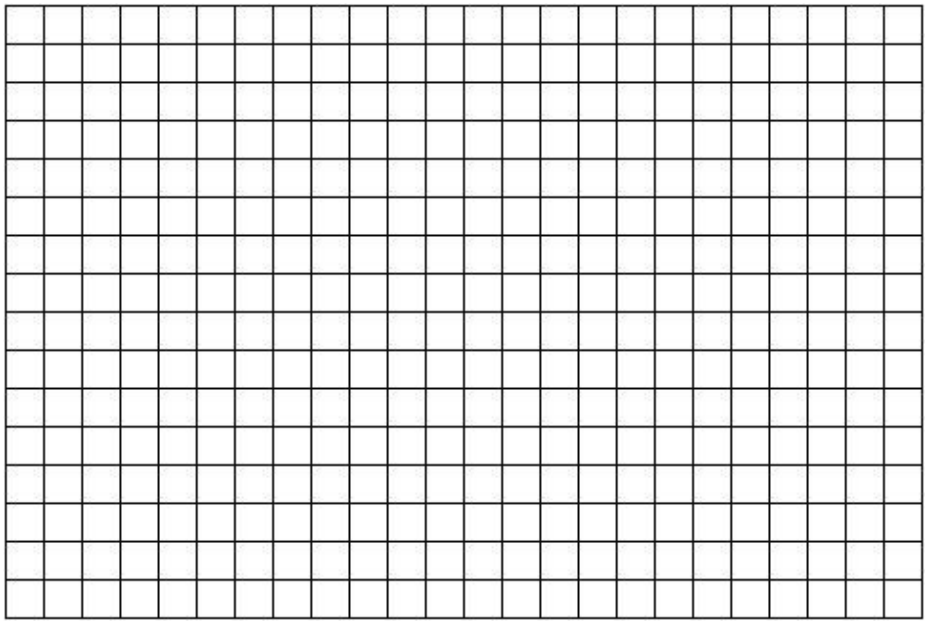
(b) If Juan pays \$10 for a discount card, then coffee costs \$2.90/mug instead. How much (total) would Juan spend on coffee in a month if he buys the discount card first? Still use 22 workdays. Include the \$10.

(c) Does the card pay for itself within the month? That means, is the total with the card (including the \$10 for the card) less than the total without the card?

(d) Complete the table, where M is the number of mugs of coffee Juan buys and T is the total cost, in dollars.

M	0	10	22	50
T (regular)				
T (with card)				

(e) Draw a graph illustrating both functions.



(f) What does the point where the two lines cross mean in terms of the story?

When you're done ...

- ☐ Check your solutions. Still confused? Work with a classmate, instructor, or tutor.
- ☐ Try the **Do you know** questions. Not sure? Read the textbook and try again.
- ☐ Make a list of key ideas and process to remember under **Don't forget!**
- ☐ Do the textbook exercises and check your answers. Not sure if you are close enough? Compare answers with a classmate or ask your instructor or tutor.
- ☐ Getting the wrong answers or stuck? Re-read the section and try again. If you are still stuck, work with a classmate or go to your instructor's office hours or tutor hours.
- ☐ It is normal to find some parts of exercises difficult, but if most of them are a struggle, meet with your instructor or advisor about possible strategies or support services.

Do you know ...

(a) Where the independent and dependent variables appear in a table and in a graph?

(b) How to guess values from a table or from a graph?

(c) How to make a graph from a table?

(d) Why we start each axis at 0?

(e) What we mean by scaling an axis evenly?

(f) How to make a table and then a graph from a story?

(g) Why we draw in a smooth line or curve connecting the points?

(h) What type of graphing technology, if any, you're allowed to use? *Ask your instructor.*

Don't forget!