Good Morning!

Today you will need:
- corrected <u>front</u> of 1.3 labsheet
- graph spiral
- pencil
- calculator

Warm-Up

In your graph paper, answer the following questions:

For the situations below, determine the <u>dependent</u> and <u>independent</u> variables.

1. Three friends go on a bicycle trip and keep track of their distance and time, so they can calculate their average speed.

2. George is ordering water bottles to advertise his company, and needs to find the cost for any number of bottles.

3. The temperature at the North Pole is expected to drop 5 degrees each hour for the next several hours.

1.3 Raising Money
Using Linear Relationships

In *Variables and Patterns*, you looked at situations that involved *dependent* and *independent* variables. In Problem 1.2, the distance walked depended on the time. This tells you that distance is the **dependent variable** and time is the **independent variable**. In this Problem, you will look at relationships between two other variables in a walkathon.

Each participant in the walkathon must find sponsors to pledge a certain amount of money for each kilometer the participant walks.

The students in Ms. Chang's class are trying to estimate how much money they might be able to raise. Several questions come up in their discussions:

- What variables can affect the amount of money that is collected?
- How can you use these variables to estimate the amount of money each student will collect?
- Will the amount of money collected be the same for each walker?

Each student found sponsors who are willing to pledge money according to the following descriptions.

- Leanne's sponsors will donate $10 regardless of how far she walks.
- Gilberto's sponsors will donate $2 per kilometer (km).
- Alana's sponsors will make a $5 donation plus 50¢ per kilometer.

The class refers to these as *pledge plans*.

Tables, graphs, and equations will help you predict how much money might be raised with each plan.

Walkathon! Pledge Sheet
Walker: *Gilberto*
Kilometers Walked:

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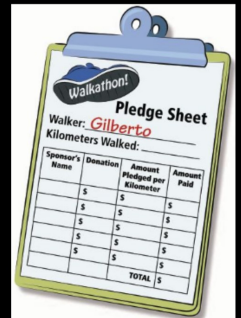
4. a) What pattern of change do you observe for <u>Alana</u> in the <u>table</u>?

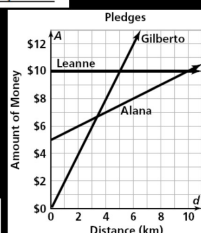| Distance (km)	Amount of Money		
	Alana	Gilberto	Leanne
0	$5	$0	$10
1	$5.50	$2	$10
2	$6	$4	$10
3	$6.50	$6	$10
4	$7	$8	$10
5	$7.50	$10	$10
6	$8	$12	$10

b) What pattern of change do you observe for <u>Gilberto</u> in the <u>graph</u>?

c) What pattern of change do you observe for <u>Alana and Gilberto</u> in the <u>equation</u>?

Alana:

Gilberto:

d) What is different about the patterns of change for <u>Leanne</u>?

Alana: *m = 5 + 0.50d*
Gilberto: *m = 2d*
Leanne: *m = 10*

Class Work Answers:

4. a. on Alana's table: as the distance increases by 1 km, the money raised increases by $0.50

b. on Gilberto's graph: to go from one point to the next, move right one km and up $2

c. Alana's equation: 0.50*d* tells us how much the money raised increases per km

Gilberto's equation: 2*d* tells us how much the money raised increases per km

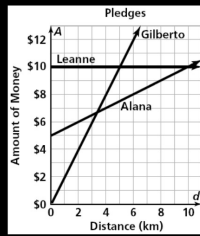d. For Leanne, as the distance increases by 1 km, there is no change in the amount of money raised

Panel 1

5. In Alana's plan, how is the fixed $5 donation represented in the...

a. ...table?

b. ...graph?

c. ...equation?

Distance (km)	Amount of Money		
	Alana	Gilberto	Leanne
0	$5	$0	$10
1	$5.50	$2	$10
2	$6	$4	$10
3	$6.50	$6	$10
4	$7	$8	$10
5	$7.50	$10	$10
6	$8	$12	$10

Pledges

Alana: $m = 5 + 0.50d$
Gilberto: $m = 2d$
Leanne: $m = 10$

Panel 2

6. Do any of the pledge plans represent a proportional relationship? Explain.

7. Do any of the pledge plans represent a linear relationship? Explain.

Panel 3

Class Work Answers:

5. a. In the table, when her distance is 0, she already has $5

   b. In the graph, (0, 5) is the starting point

   c. In the equation, 5 is added to 0.5x

6. Gilberto's plan is a proportional relationship because the graph is a straight line though (0, 0), and his table has equivalent ratios between the values.

7. All the plans are linear relationships because all the graphs are straight lines.

Panel 4

Homework:

finish back of 1.3 labsheet

Panel 5

Homework Answers:

5. a. In the table, when her distance is 0, she already has $5

   b. In the graph, (0, 5) is the starting point

   c. In the equation, 5 is added to 0.5x

6. Gilberto's plan is a proportional relationship because the graph is a straight line though (0, 0), and his table has equivalent ratios between the values.

7. All the plans are linear relationships because all the graphs are straight lines.