

Comparing Functions

Comparing Functions

Click [here](#) to download lesson.

This lesson was implemented over two days.

Day 1: Analysis of basic graph shapes and discussion on two functions

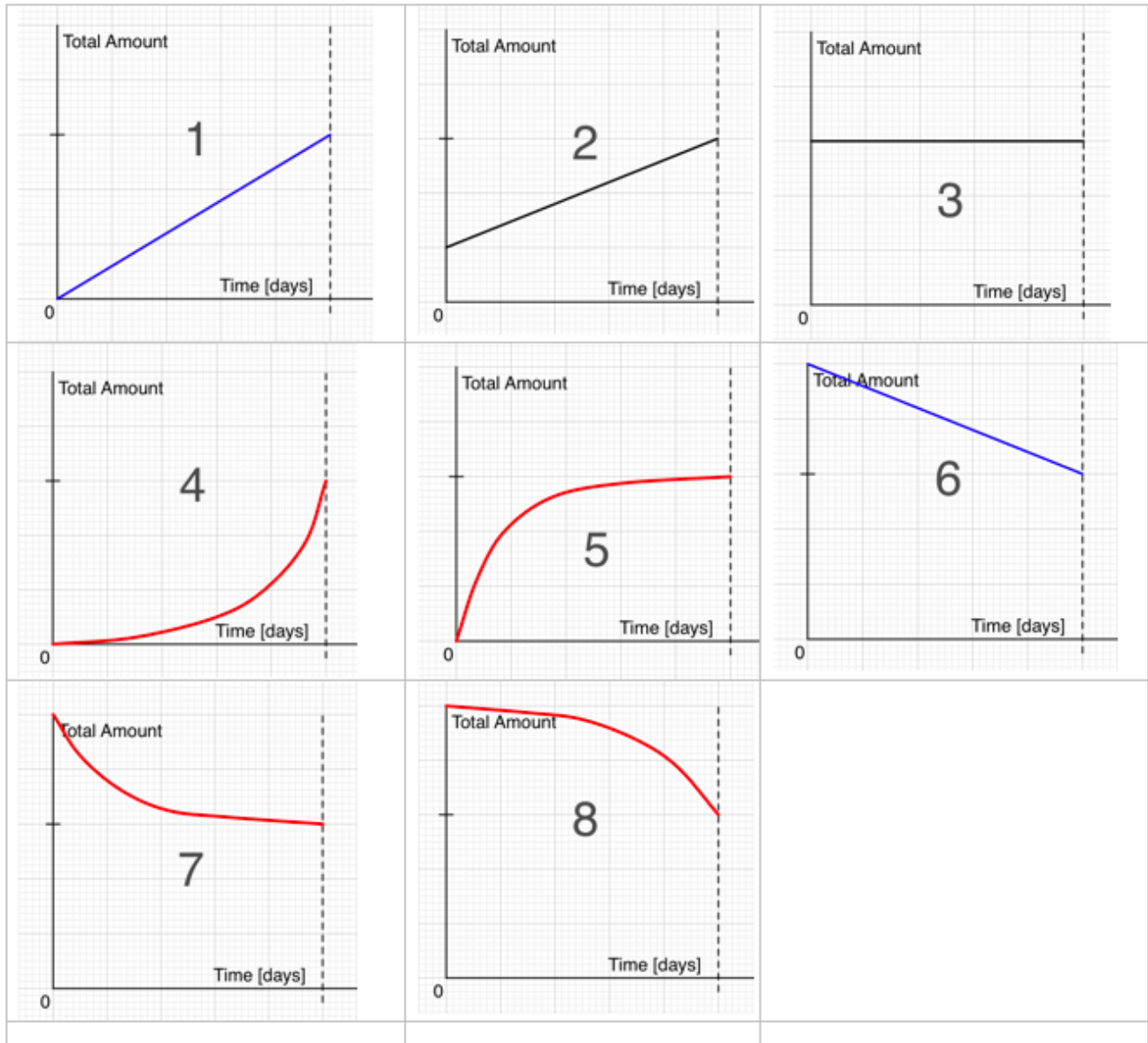
Day 2: Choosing graphs to match descriptions of linear and non-linear function

Summary	This lesson is split into two days. In the first class, the students will analyze eight basic graph shapes and will represent and solve a verbal problem involving the choice between two functions. In the second one they will be asked to choose, among the eight basic graph shapes, the ones that matches specific situations.
Goals	Use tables, graphs, and algebraic notation to solve problems.
Materials	Overheads, Handouts
Keywords	Compare/Contrast Functions Contextualized Situations Full Class Discussion Interpretation of Graphs Interpretation of Stories Interpretation of Tables Linear Function Non-Linear Functions Production of Graphs Production of Tables Small Group Work

Activity Plan:

1. Discussing basic graph shapes [Whole Class; 20 minutes]

Go over each graph below (Overhead page 1), discussing its meaning. Which graphs show increases, decreases, no change? Which one increases faster and faster? Which one decreases lower and slower?



2. Discussing the Two Options [Group Work]

Show the problem on the second overhead (page 2) and ask children to read it.

Ask the children to state what they would prefer.

Distribute the handout (page 2) and ask the children to explain their views and to draw graphs for the two deals.

Your grandmother offers to give you, for the whole year:

- Deal A: 5 cents every day
- Deal B:
 - She gives 1 cent on day 1,
 - She gives 2 cents on day 2,
 - She gives 3 cents on day 3, and so forth.

Which deal would you accept, Deal A or Deal B?

Show that the deal you chose is better.

What would a graph of each of the deals look like?

3. Representing the Two Options in a Table [Group Work]

Distribute the handout (page 3) and ask children to complete the two tables and to state and to justify, in writing, what they would prefer.

4. Discussion of Handout: Comparing the Two Functions [Whole Class]

Display the third overhead (page 3) and ask a few volunteers to present and discuss their answers. Ask questions such as:

Is one option better than the other? Always?

When is option 1 better than option 2?

When is option 2 better than option 1?

Are there days when the two options will give you the same amount of money?

5. Choosing the basic shapes (Page 4)

Distribute the handout (page 4) and ask children to choose the basic shapes representing the two deals. Display the corresponding overhead (page 4) and discuss children's answers.

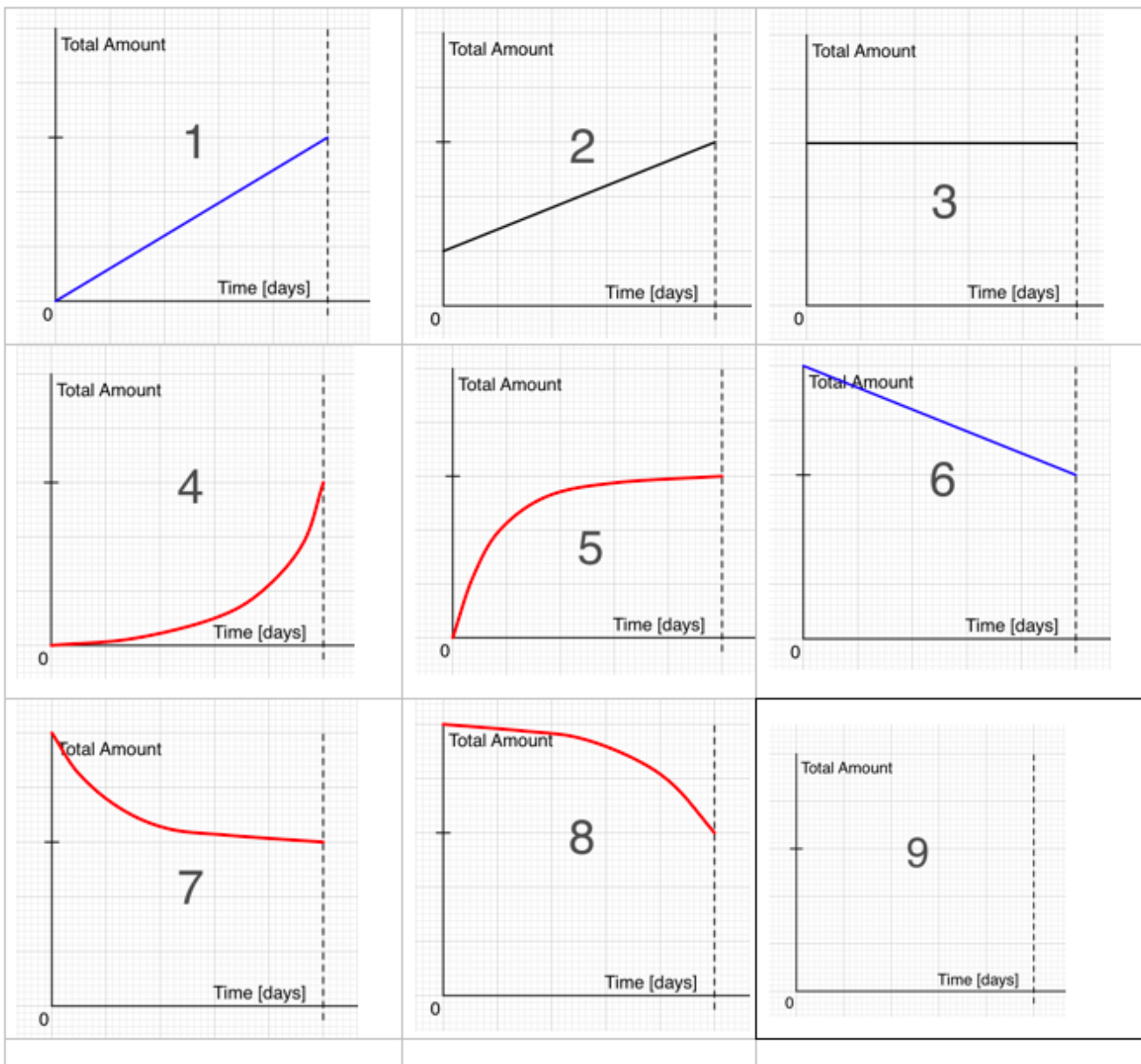
6. Homework (Pages 5 & 6)

They will solve a problem similar to the one they discussed in class.

Overhead and Handout:

(Page 1)

Name: _____ Date: _____



Overhead: The Problem

(Page 2)

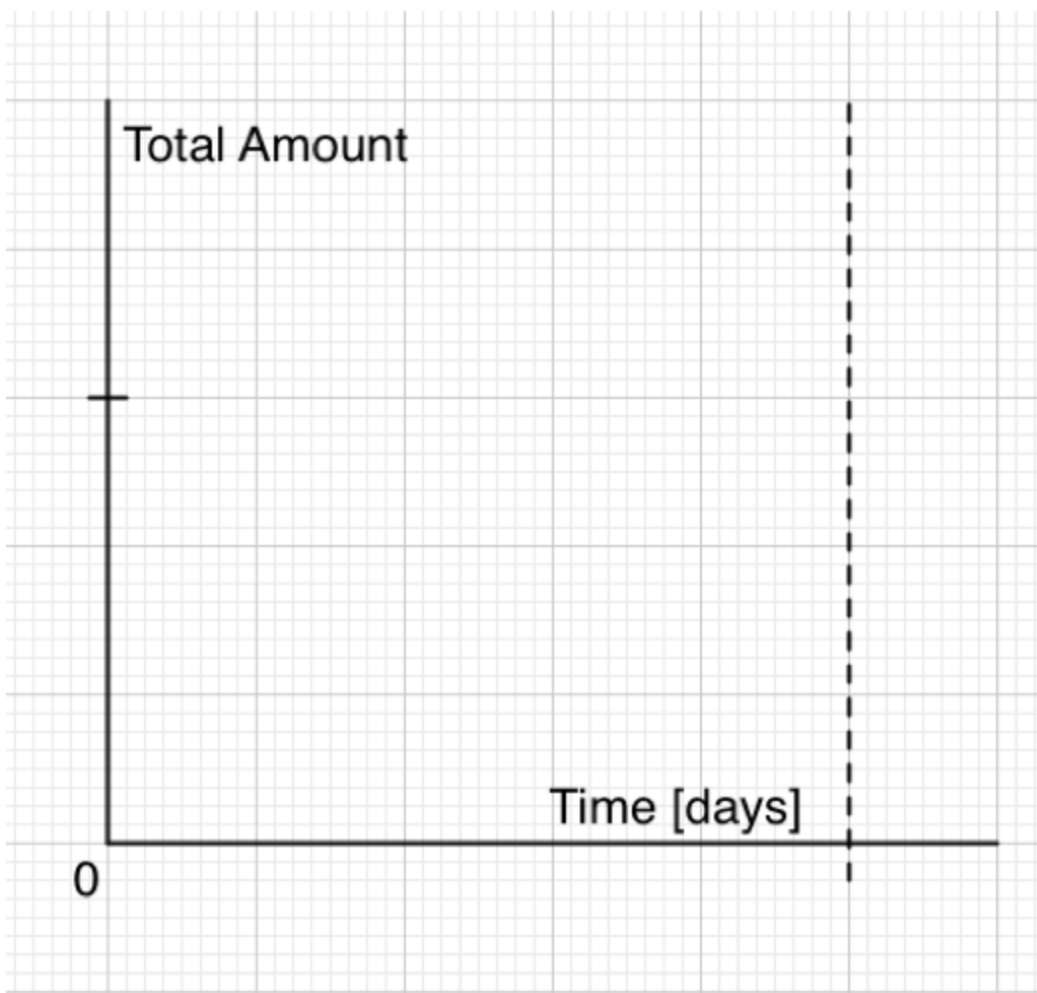
Your grandmother offers to give you, for the whole year:

- Deal A: 5 cents every day
- Deal B:
 - She gives 1 cent on day 1,
 - She gives 2 cents on day 2,
 - She gives 3 cents on day 3, and so forth.

Which deal would you accept, Deal A or Deal B?

Show that the deal you chose is better.

What would a graph of each of the deals look like?



Overhead and Handout: Representing the Problem

(Page 3)

Name: _____ Date: _____

Your grandmother offers you two deals for a whole year.

- **Deal A:**
 - She will give you 5 cents on each day for a year, or
- **Deal B:**
 - She will give you 1 cent on day 1,
 - 2 cents on day 2,
 - 3 cents on day 3, and so forth.

Which deal would you accept, Deal A or B? _____

DEAL A			DEAL B		
Day	DA change	A	Day	DB change	B
1	+.05	\$.05	1	+.01	\$.01
2	+.05	\$.10	2	+.02	\$.03
3	+.05	\$.15	3	+.03	\$.06
4	+.05	\$.20	4	+.04	\$.10
5	+.05	\$.25	5	+.05	\$.15
6	+.05	\$.30	6	+.06	\$.21
7	+.05	\$.35	7	+.07	
8	+.05	\$.40	8	+.08	
9	+.05	\$.45	9	+.09	
10	+.05		10	+.10	
11	+.05		11	+.11	
12	+.05		12	+.12	

True or False?

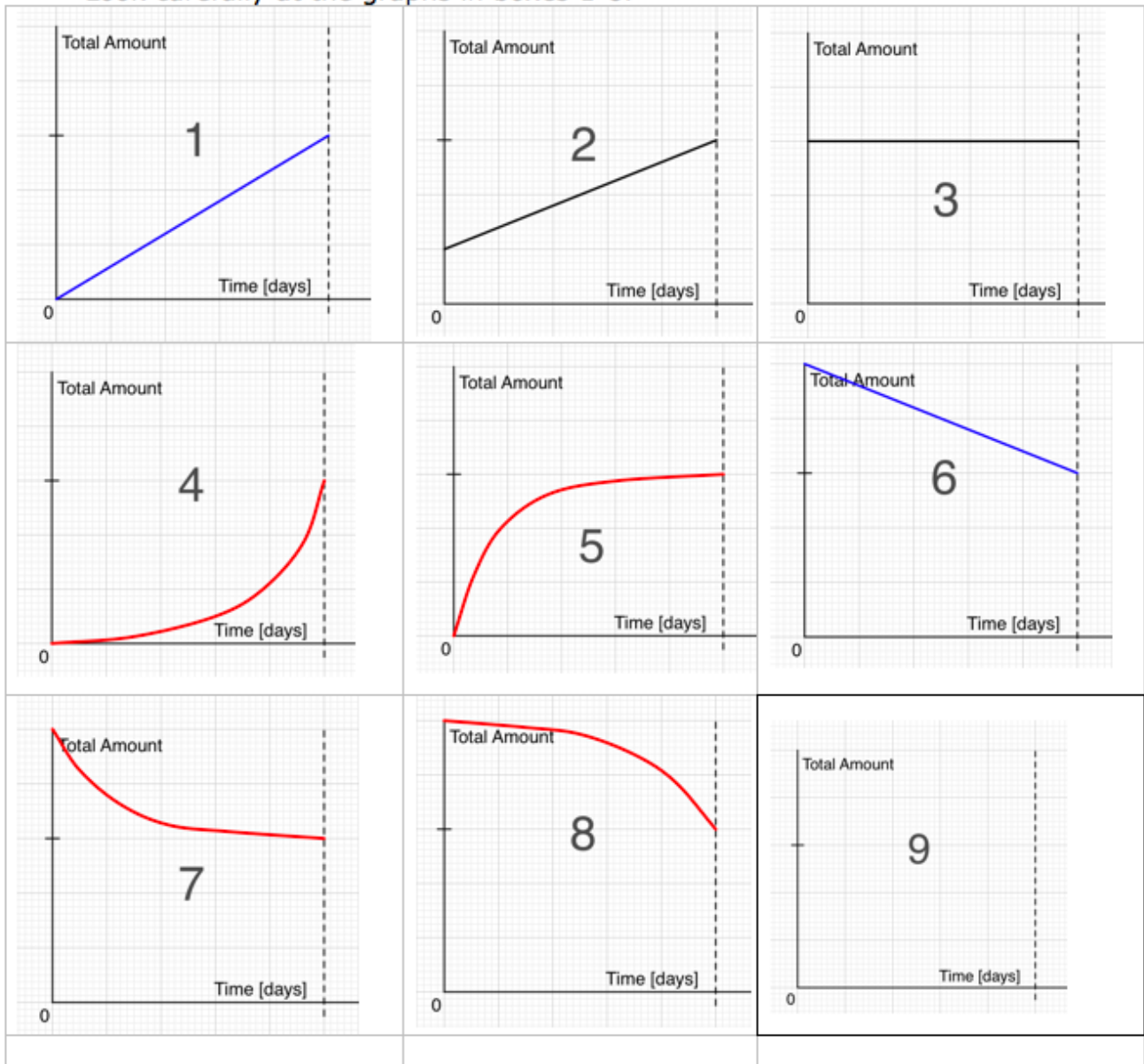
1. The total amount for Deal A increases at a steady rate: True False
2. The total amount for Deal B increases at a steady rate: True False

Which Deal is better at the end of one year? Explain.

Overhead and Handout: Representing the Problem (Page 4)

Name: _____ Date: _____

Look carefully at the graphs in boxes 1-8.



Deal A is like Graph _____. Deal B is like Graph _____.

In box 9, draw graphs for both Deal A and Deal B.

Overhead and Homework

(Page 5)

Name: _____ Date: _____

Your grandfather offers to give you, for one month...

- Deal K: 5 dollars on each day.
- Deal L:
 - 1 dollar on day 1,
 - 2 dollars on day 2,
 - 3 dollars on day 3, and so forth.

Which deal would you accept, Deal K or Deal L? _____

DEAL K			DEAL L		
Day	DK change	K	Day	DL change	L
1	+\$5	\$5	1	+\$1	\$1
2	+\$5	\$10	2	+\$2	\$3
3	+\$5	\$15	3	+\$3	\$6
4	+\$5	\$20	4	+\$4	\$10
5	+\$5	\$25	5	+\$5	\$15
6	+\$5	\$30	6	+\$6	
7	+\$5	\$35	7	+\$7	
8	+\$5	\$40	8	+\$8	
9	+\$5	\$45	9	+\$9	
10	+\$5		10	+\$9	
11	+\$5		11	+\$9	
12	+\$5		12	+\$9	

True or False?

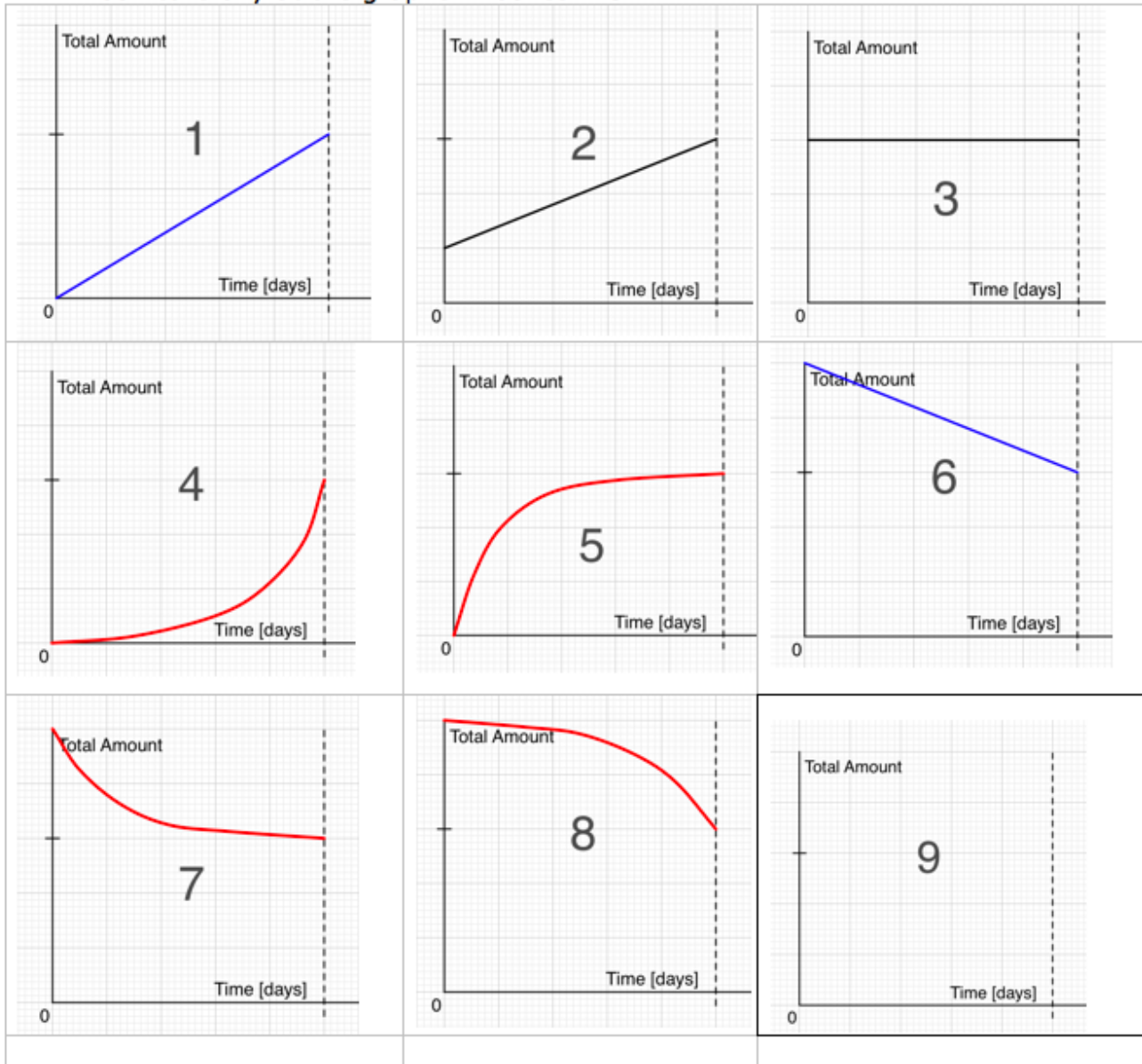
1. The total amount for Deal K increases at a steady rate: True False
2. The total amount for Deal L increases at a steady rate: True False

Which Deal is better at the end of one month? Explain.

Overhead and Homework

Name: _____ Date: _____

Look carefully at the graphs in boxes 1-8.



Deal K is like Graph _____. Deal L is like Graph _____.

In box 9, draw graphs for both Deal K and Deal L.