Word Problems for Linear Graphs

1. A travel company is printing brochures. The printing will cost $5 to design the brochure, and then $1.50 for each brochure that they print.
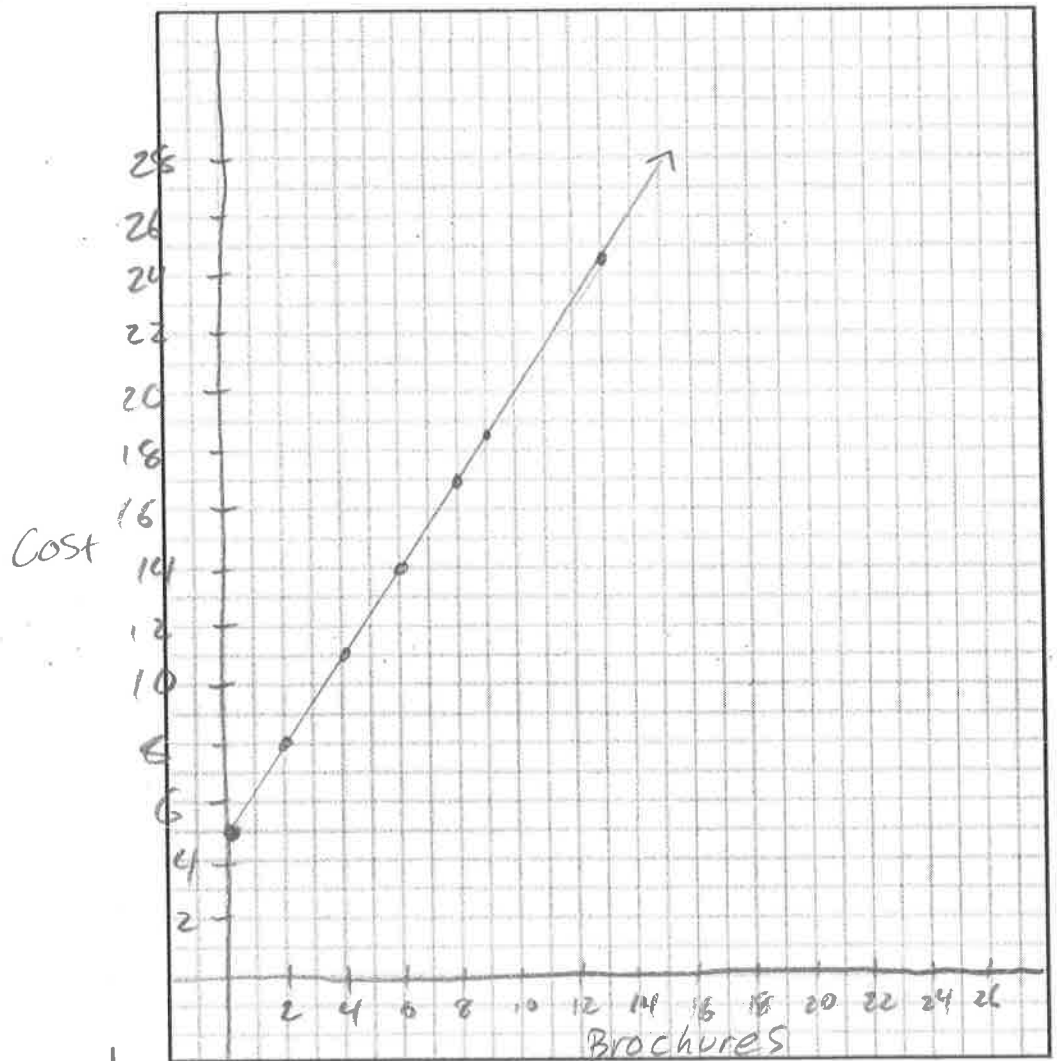
a) Write an equation for the cost (C) related to the number of brochures printed (n)

$$C = 1.5n + 5$$

b) Create a table of values, then plot the graph of the cost and the number of brochures.
(**HINT**: Which should go on the y-axis and x-axis?)

Cost	Brochures
5	0
8	2
11	4
14	6
17	8

c) **Using the graph,** find the cost for 13 brochures. Compare to using your equation.

Graph: $24.50   Equation: C = 1.5(13) + 5 = $24.50

Using the graph, find how many brochures were printed if the company was charged $18.50

9 brochures

2. Telus offers two mobile phone plans. Each has unlimited calling, but different rates for data.
Plan A: $40/month plus $10 per GB of data   **Plan B:** $70/month plus $5 per GB of data

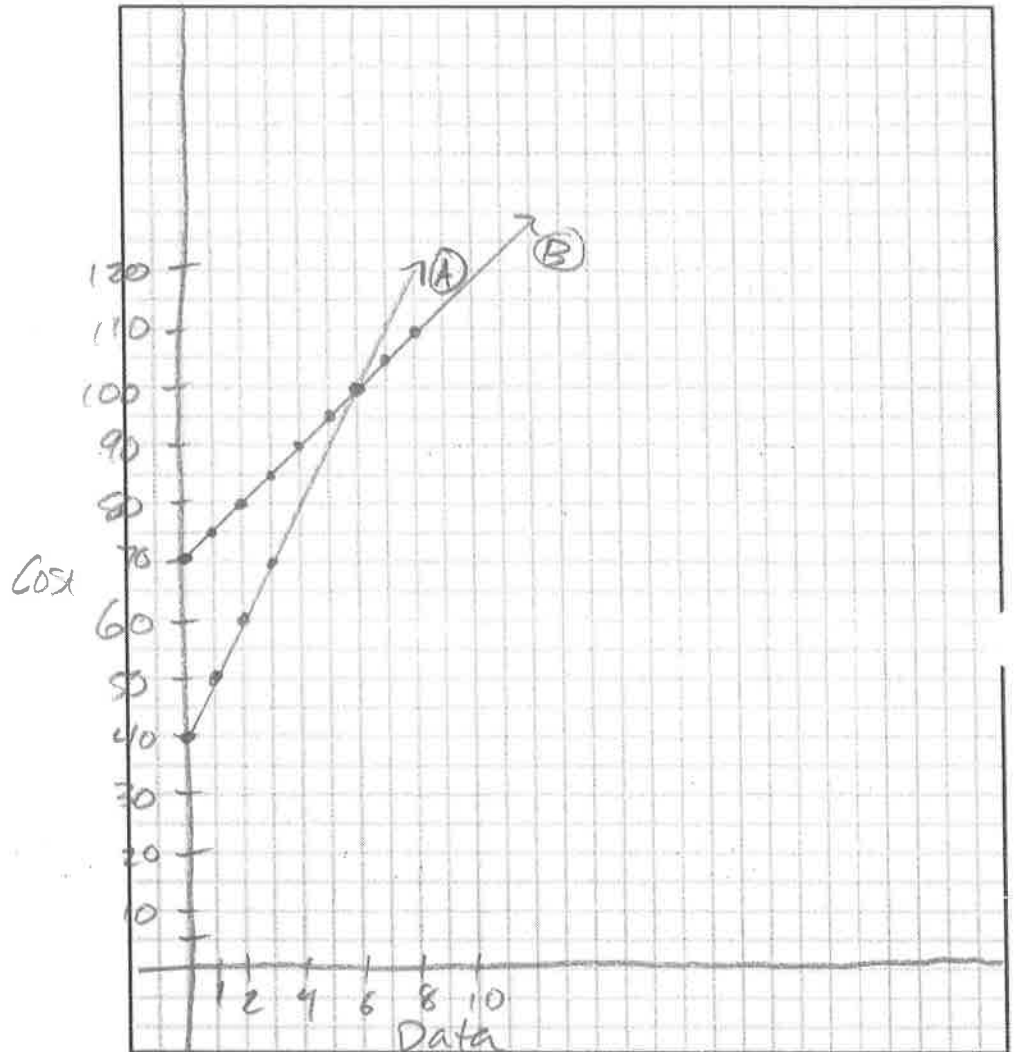a) Write an equation for the monthly cost (C) for Plan A and Plan B related to the amount data used (d).

(A) $C = 40 + 10d$ (B) $C = 70 + 5d$

b) Create tables of values, then plot the cost and the amount of data for both plans (include labels!)

Plan A Cost | Data
Cost	Data
40	0
50	1
60	2
70	3
80	4

Plan B Cost | data
Cost	data
70	0
75	1
80	2
85	3
90	4

c) Sally is trying to decide on which plan to choose. She looks at her data usage history and she uses about 7 GB each month. Which plan should she choose?

(B)   It costs less!

d) Sidney looks at her data usage and says that either plan would cost the same for her. How much data does she use each month?

6 GB (Graphs intersect)

e) Which plan should **you** choose based on your data usage?

(?)

Applications of Linear Graphs

1. A car rental company charges a daily rate plus a charge per km driven. The charge for one day with 30 km driven is $35, while the charge for one day with 80 km driven is $60.

a) What is the cost for each km driven?

$$\begin{array}{c|cc}
d & 30km & 80 \\
\hline
c & 35 & 60
\end{array}$$

+50km

+$25

$\div 50$ $+50km \Rightarrow +\$25$ $\div 50$
$\Rightarrow +1km \Rightarrow +\$0.5$

$\boxed{\$0.50/km}$

b) How much would it cost for one day with 100km driven?

80km is $60

+ 20km is $20 \times 0.5 = +\$10$ $\Rightarrow$ Cost for 100km $\rightarrow \$60 + \$10 = \boxed{\$70}$

c) Write an equation for the cost (C) related to the distance driven (d)

$$C = 0.5d + (\text{starting charge})$$

$$\boxed{C = 0.5d + 20}$$

30km is $35

So, 0km is $-30 \times 0.5 = -\$15$

So, starting charge (0km) is $\$35 - \$15 = \$20$

2. For his 14th birthday, Frankie's grandmother gave him some spending money. Every week, he spent some of that money on video games, food, and going to the movies. He kept track of the balance in his back account.

↓ $40

Money in account (M)	220	180	140	100
Number of weeks (w)	2	4	6	8

+2 weeks

a) How much money did Frankie start with in his account?

starting amount: 0 weeks

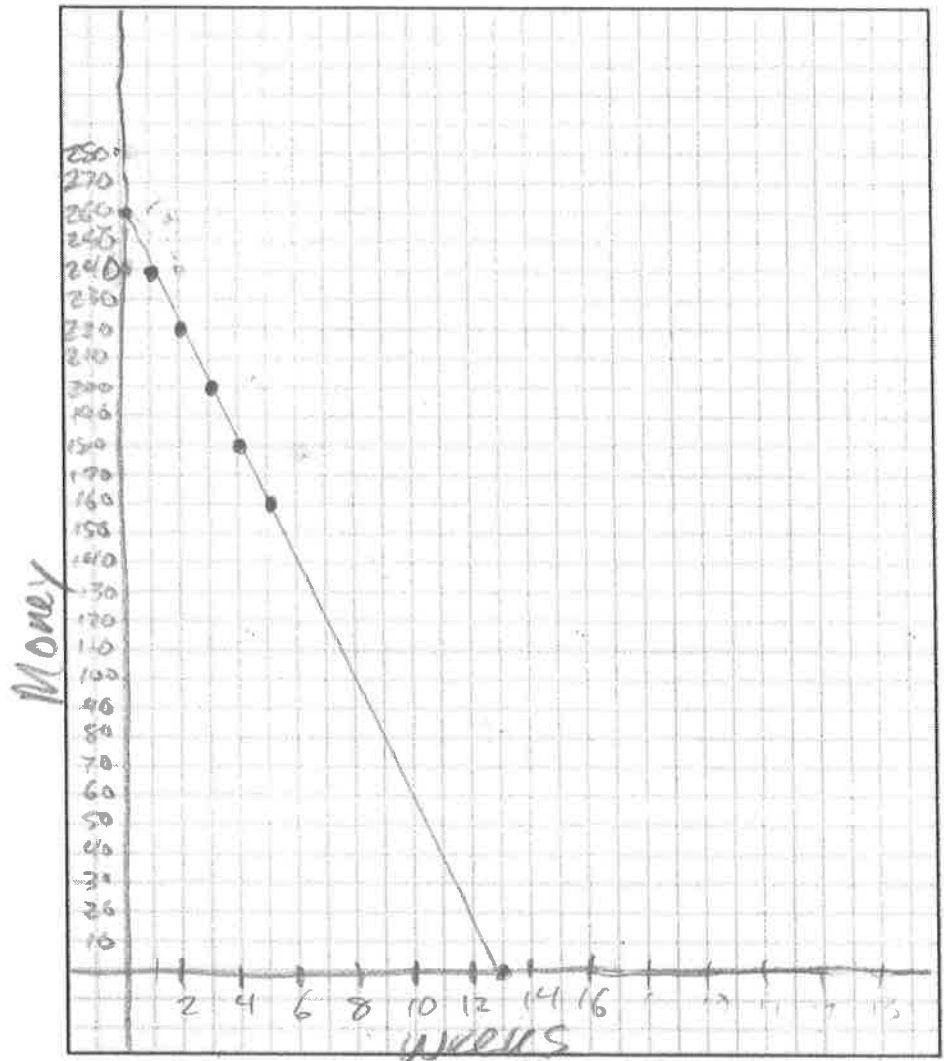$\div 2$ $+2$ weeks $\Rightarrow -\$40$ $\div 2$
$+1$ week $\Rightarrow -\$20$

$\$220 + \$40 = \boxed{\$260}$

b) Write an equation for the amount of money in the account (M) related to the number of weeks (w).

$$\boxed{M = -20w + 260}$$

c) Plot a graph of the money in the account and the number of weeks.

Money	weeks
260	0
240	1
220	2
200	3
180	4

d) If the spending continues, when will Frankie run out of money? (*You can use your graph or equation!*)

Equation

$$M = 0 = -20w + 260$$

$$\xrightarrow{\div 20} 20w = 260 \div 20$$

$$\boxed{w = 13}$$

Graph:

(13 weeks)