

II.

Practice

Solve.

$$y = mx + b$$

1. Lin is tracking the progress of her plant's growth. Today the plant is 5 cm high. The plant grows 1.5 cm per day.

- Write a linear model that represents the height of the plant after d days.
- What will the height of the plant be after 20 days?

2. Mr. Thompson is on a diet. He currently weighs 260 pounds. He loses 4 pounds per month.

$$\begin{aligned} 220 &= -4x + 260 \\ -40 &= -4x \\ x &= 10 \end{aligned}$$

- Write a linear model that represents Mr. Thompson's weight after m months.
- After how many months will Mr. Thompson reach his goal weight of 220 pounds?

3. Paul opens a savings account with \$350. He saves \$150 per month. Assume that he does not withdraw money or make any additional deposits.

$$\begin{aligned} y &= mx + b \\ y &= 150x + 350 \\ 2000 &= 150x + 350 \\ -350 & \quad -350 \\ \hline 1650 &= 150x \\ \frac{1650}{150} &= \frac{150x}{150} \\ x &= 11 \text{ months} \end{aligned}$$

- Write a linear model that represents the total amount of money Paul deposits into his account after m months.
- After how many months will Paul have more than \$2,000?

4. The population of Bay Village is 35,000 today. Every year the population of Bay Village increases by 750 people.

- Write a linear model that represents the population of Bay Village x years from today.
- In approximately many years will the population of Bay Village exceed 50,000 people?

$$\begin{aligned} 50000 &= 750x + 35000 \\ -35000 & \quad -35000 \\ \hline 15000 &= 750x \\ \frac{15000}{750} &= \frac{750x}{750} \\ x &= 20 \text{ years} \end{aligned}$$

$$Y = -1500x + 25000$$

$$-1500(8) + 25000 = 13000$$

5. Conner has \$25,000 in his bank account. Every month he spends \$1,500. He does not add money to the account.
- Write a linear model that shows how much money will be in the account after x months.
 - How much money will Conner have in his account after 8 months?

6. A cell phone plan costs \$30 per month for unlimited calling plus \$0.15 per text message.
- Write a linear model that represents the monthly cost of this cell phone plan if the user sends t text messages.
 - If you send 200 text messages, how much would you pay according to this cell phone plan?

7. Ben walks at a rate of 3 miles per hour. He runs at a rate of 6 miles per hour. In one week, the combined distance that he walks and runs is 210 miles.

$$3w + 6r = 210$$

$$3w + 6(25) = 210$$

$$3w + 150 = 210$$

$$3w = 60$$

$$w = 20$$

- Write a linear model that relates the number of hours that Ben walks to the number of hours Ben runs.
- Ben runs for 25 hours. For how many hours does he ~~run~~ walk?

8. A salesperson receives a base salary of \$35,000 and a commission of 10% of the total sales for the year.

$$3w = -6r + 210$$

$$w = -2r + 70$$

- Write a linear model that shows the salesperson's total income based on total sales of k dollars.—
- If the salesperson sells \$250,000 worth of merchandise, what is her total income for the year, including her base salary?

$$Y = 0.1x + 35,000$$

$$Y = (0.1)(250,000) + 35,000$$

$$= 25,000 + 35,000$$

$$= 60,000$$

9. Amery has x books that weigh 2 pounds each and y books that weigh 3 pounds each. The total weight of his books is 60 pounds.

$$= 25,000$$

$$35,000$$

$$\boxed{60,000}$$

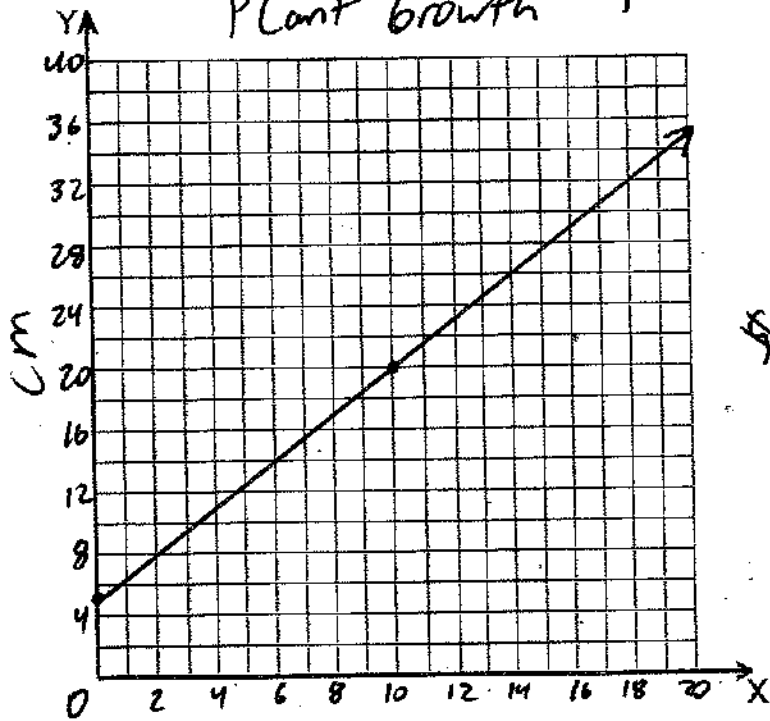
- Write a linear model that relates the number of 2 pound books to the number of 3 pound books Amery has.
- If Amery has 10 3-pound books, how many 2-pound books does he have?

$$Y = 1.5x + 5$$

#1

x	y
0	5
20	35
10	20

Plant Growth

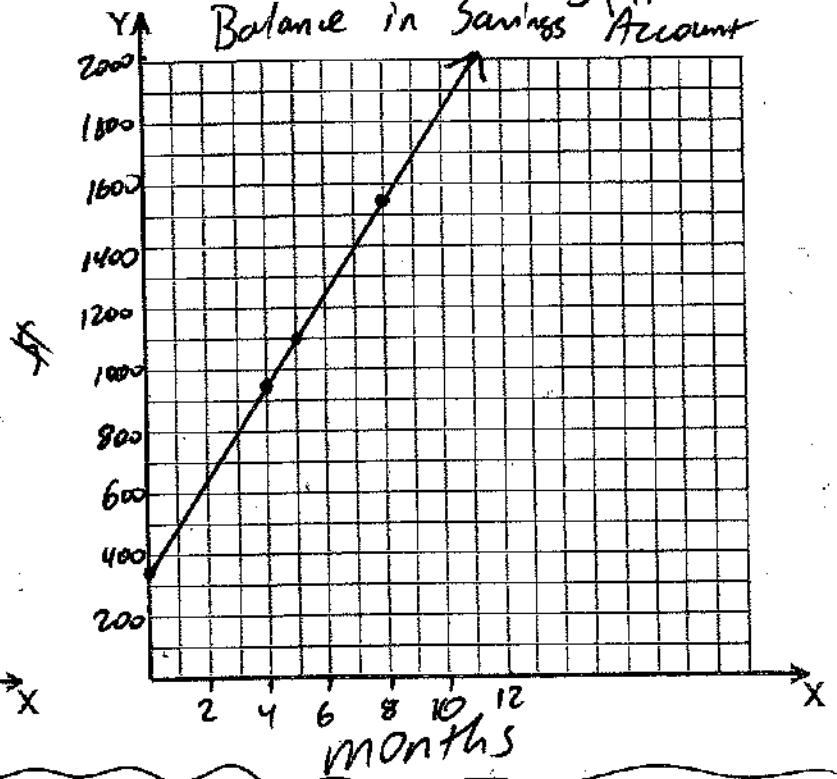


$$Y = 150x + 350$$

#3

x	y
11	2000
0	350
8	1100

Balance in Savings Account



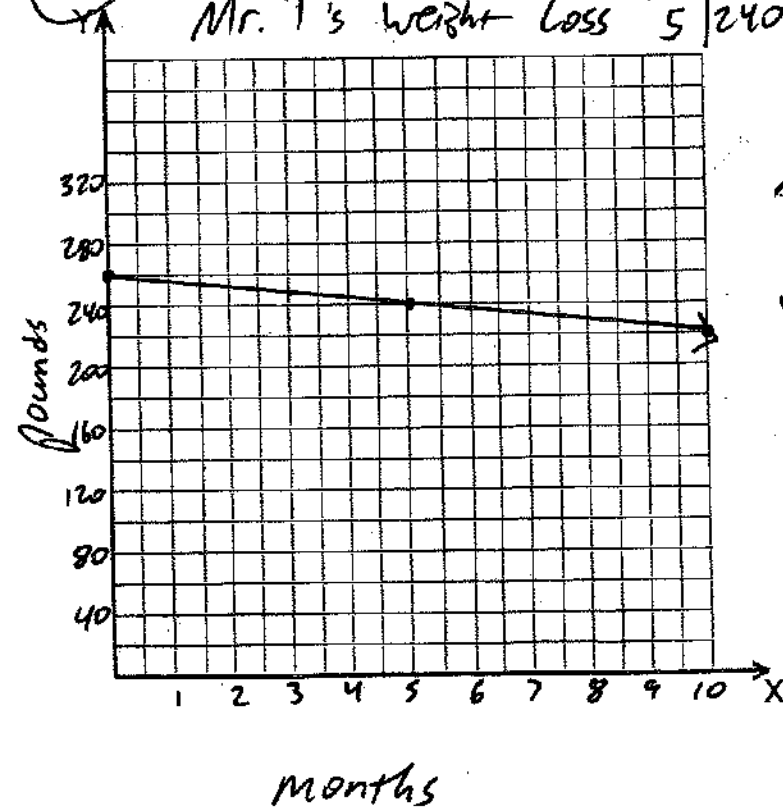
days

#2

$$Y = -4x + 260$$

Mr. T's weight loss

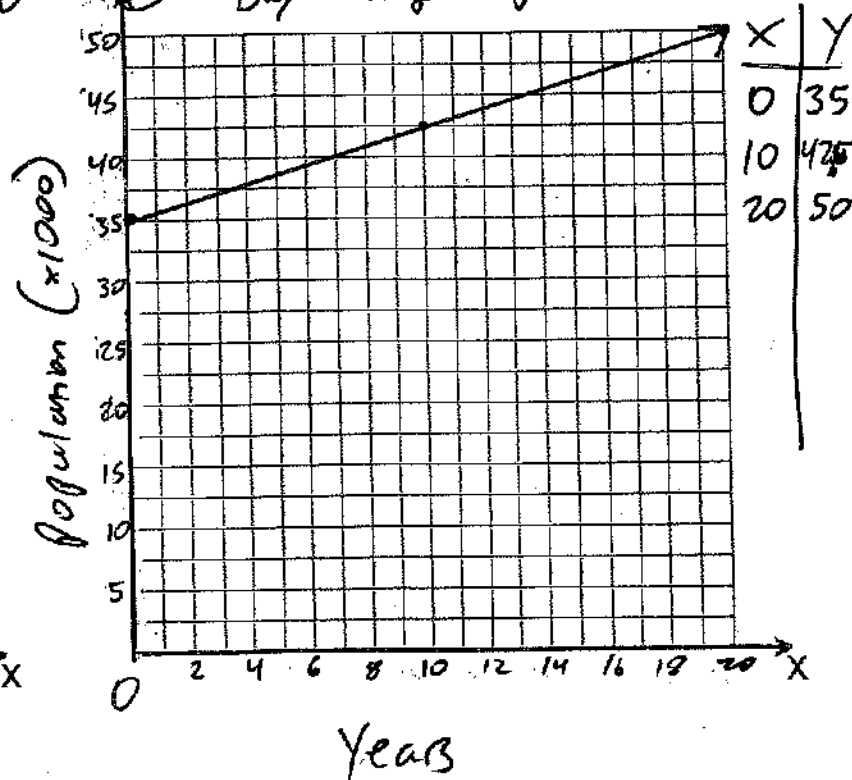
x	y
0	260
10	220
5	240



$$Y = 750x + 35000$$

#4

Bay Village Population



Years

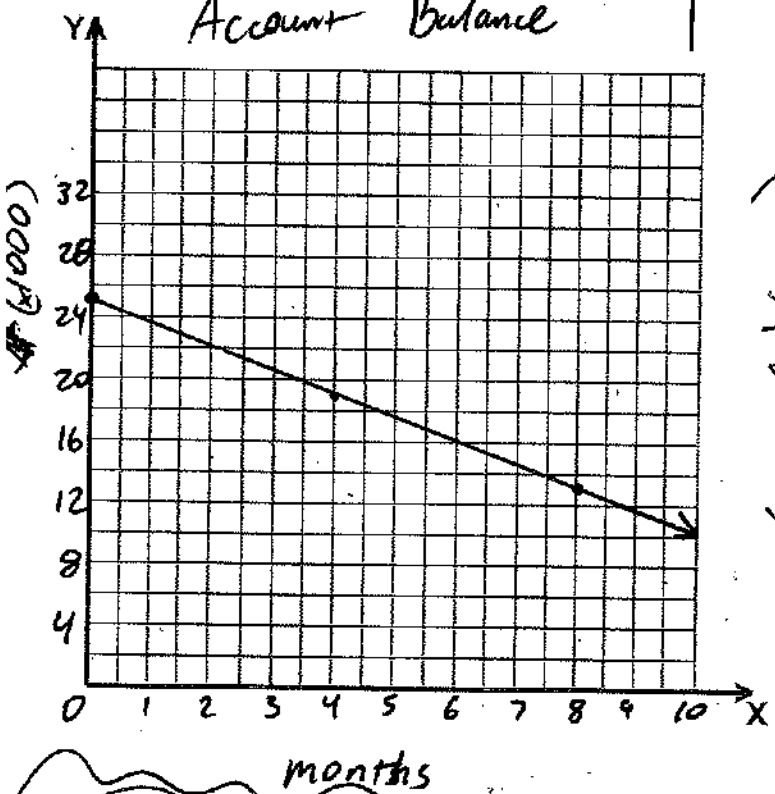


#5

$$Y = -1500x + 25000$$

Account Balance

X	Y
0	25000
8	13000
4	19000

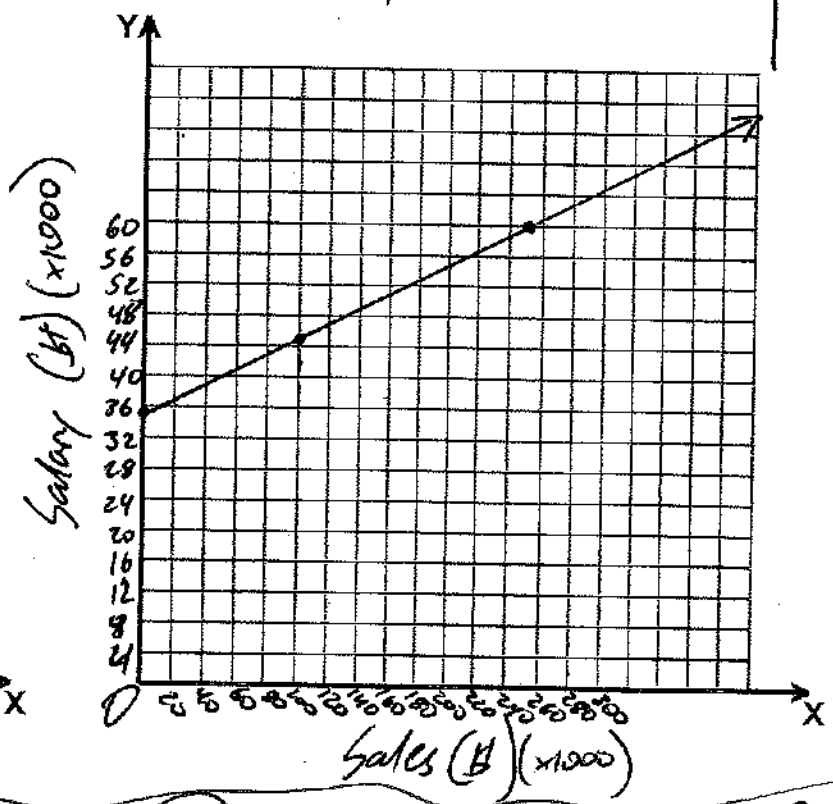


#8

$$Y = 0.1x + 35000$$

Salary vs. Sales

X (1000)	Y
0	35,000
250	60,000
100	45,000

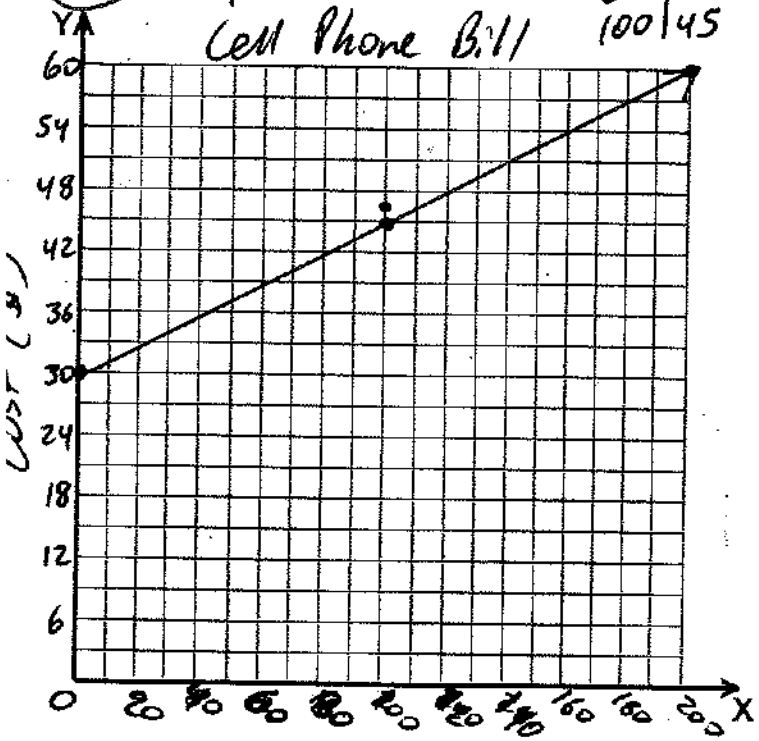


#6

$$Y = 0.15x + 30$$

Cell Phone Bill

X	Y
0	30
200	60
100	45



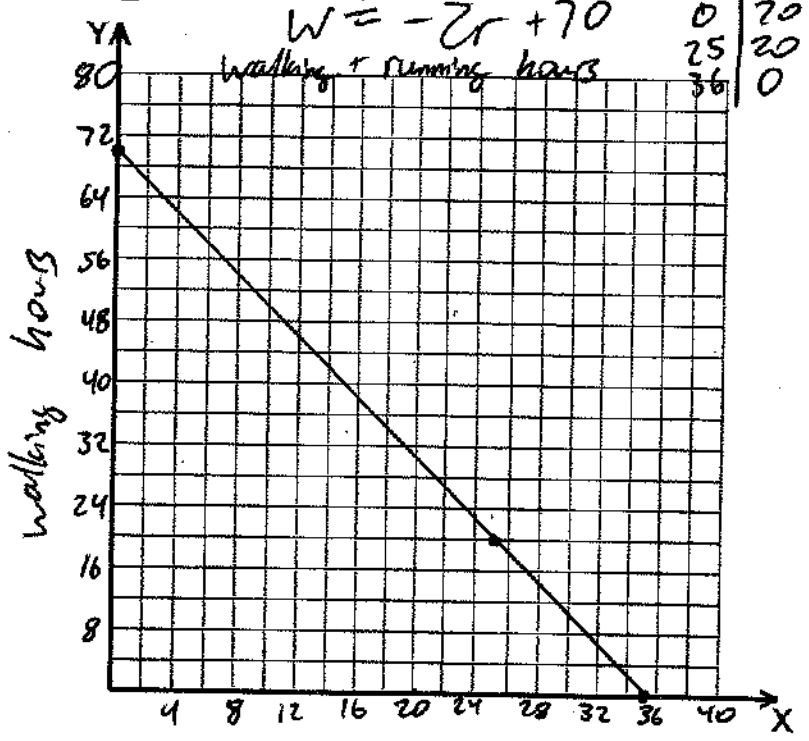
Texts

#7

$$W = -2r + 70$$

walking + running hours

W	r
0	70
25	20
36	0



running hours