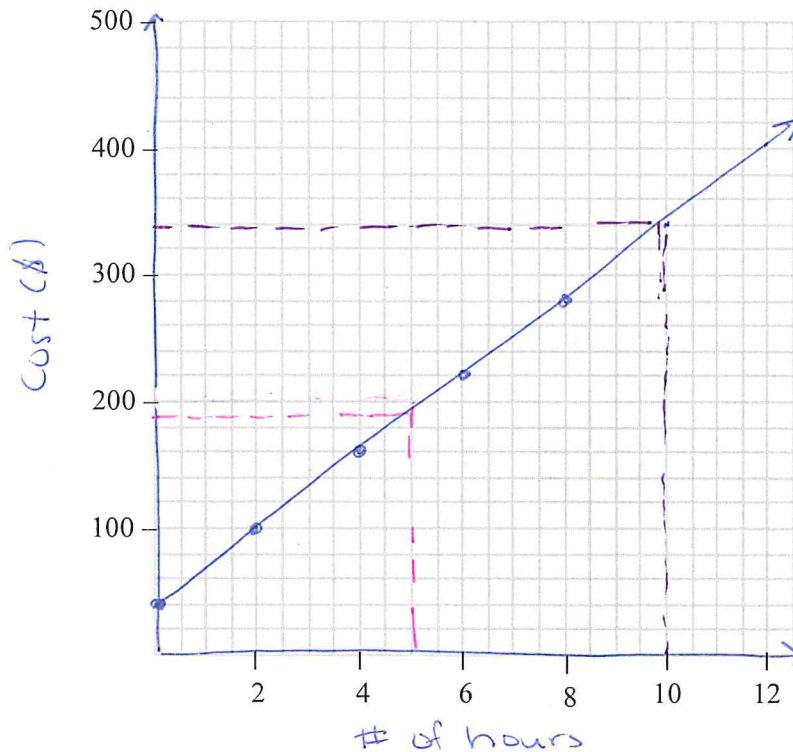# APPLICATION OF LINEAR RELATIONS

1) The ABC Repair Company charges customers $40 for examining and estimating the cost of repairing a broken appliance and $30 an hour for labour to repair it.

a) Graph the linear relation. The Table of Values shows the fee schedule, where **C** represents the total cost and **n** represents the number of hours of labour.

n	C
0	40
2	100
4	160
6	220
8	280

b) Using y = mx + b form, write the equation of this relationship. (use C and n)

$$C = 30n + 40$$

c) What is the slope in this relationship, and what does it represent?

$m = 30$ Cost per hour

d) What is the y-intercept in this relationship, and what does it represent?

$b = 40$ Initial cost

e) By looking on the graph, how much would it cost for repairs if the work took 5 hours?

$190

f) By looking on the graph, how many hours of labour were required to repair an appliance if it cost $340?

10 hours

2) A biologist studied a certain kind of tree for the past 10 years. She found that the diameter of the tree increased 2 cm each year. When the biologist began measuring, the diameter was 80 cm.

a) Graph the linear relation with the Table of Values complete. Remember: **D** is the diameter of the tree and **t** is the number of years of growth.
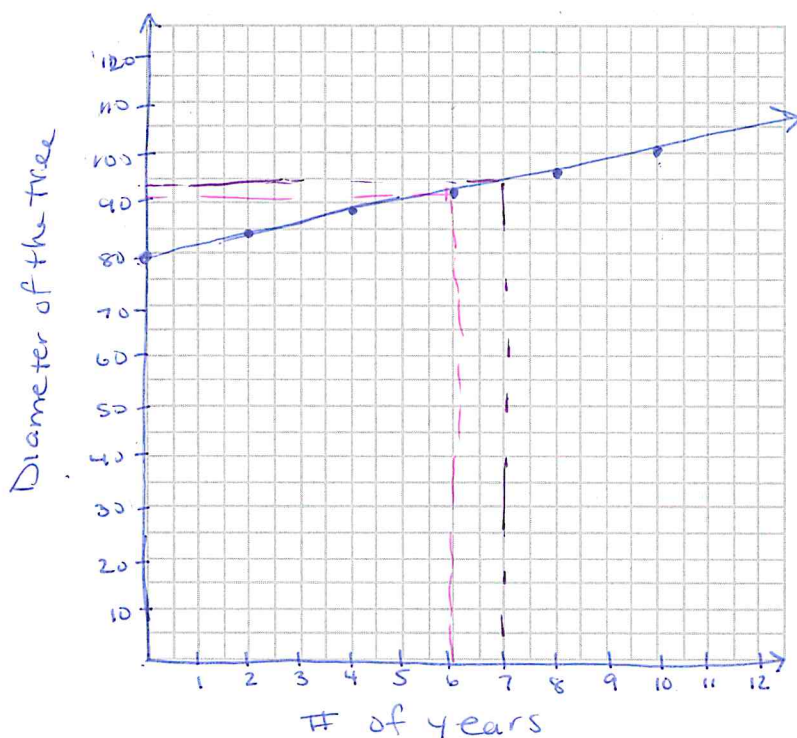
t	D
0	80
2	84
4	88
6	92
8	96
10	100

Diameter of the tree (vertical axis)

# of years (horizontal axis)

b) Using y = mx + b form, write the equation that models this tree's growth. (Use D and t)

$$D = 2t + 80$$

c) What is the slope in this relationship, and what does it represent in this problem?

m = 2   increase in diameter /year

d) What is the y-intercept in this relationship, and what does it represent in this problem?

b = 80   initial diameter

e) What was the diameter of the tree after 7 years?

94 cm

f) After how many years was the diameter 92 cm?

6 years

3) The XYZ Taxi Company charges customers $5 at the start of a fare and then $2 per km the taxi drives its customers.

a) Write an equation that models this relationship with **C** representing the total cost of the taxi fare in dollars and **n** representing the number of kilometres driven.

$$C = 2n + 5$$