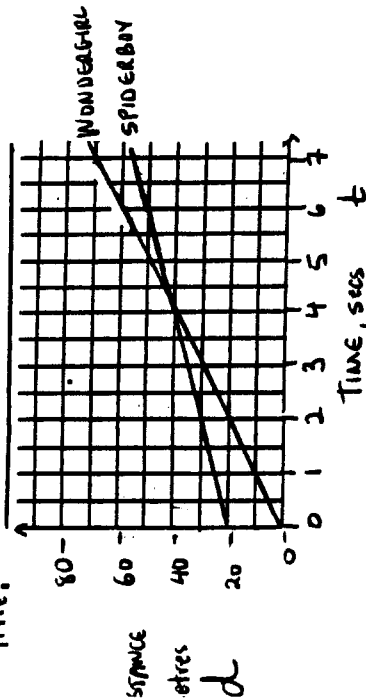


1) Answer in the spaces provided.

- a) The range of a relation is represented along the \_\_\_\_\_ axis.
- b) The independent variable is represented along the \_\_\_\_\_ axis.
- c) A linear relation must have a C \_\_\_\_\_ T \_\_\_\_\_ slope.
- d) What does 'm' represent in  $y = mx + b$  ? \_\_\_\_\_
- e) What does 'b' represent in  $y = mx + b$  ? \_\_\_\_\_

2) The graph below shows a race between two friends. Answer the questions.

Title: \_\_\_\_\_



- a) Add an appropriate title to the graph.
- b) Who runs faster? \_\_\_\_\_ What is their speed? \_\_\_\_\_
- c) Who has the head start? \_\_\_\_\_ By how much? \_\_\_\_\_
- d) Write the formulas for both runners.  
 Spiderboy \_\_\_\_\_ Wondergirl \_\_\_\_\_
- e) Using the formula, determine the distance run by Spiderboy at the 4 second mark. K3
- f) Using the formula, determine when Wondergirl reached 70 metres. K3

h)

On the graph on page 1, draw the graph of a third runner named *Superkid* who has a head start of 10 metres and runs at a speed of 4 m/sec.

Does *Superkid* ever take the lead in the race? \_\_\_\_\_

3)

The cost for renting a car from Garvin's Bestups to drive 170 km is \$57.40. The cost per kilometre is \$ 0.12. Use 'C' for cost and 'd' for distance.

a) Determine the formula for this relation.

b) What is the initial charge for renting the car? \_\_\_\_\_

4)

Slick Bles earns a base wage and a commission for every ticket that he sells to Cawthra Park's 2nd Annual Animation Festival held on June 4th, 2008.

Here is data about ticket sales and her wages. Commission is like a bonus for each ticket sold.

a) Determine the formula for this relation.

Tickets sold, t	Wages, W
240	\$345
560	\$745

- b) What is his base wage for working? \_\_\_\_\_
- c) What is his commission per ticket sold? \_\_\_\_\_

## Determining Formulas

p.4

All problems involve linear relations. Solve on lined paper with an algebraic solution. Include a final statement. Use  $y = mx + b$  for your solution the appropriate variables.

1. The cost of a hot dog with 5 toppings at **Adrian's Hot Doggins** is \$3.25. The price per topping is \$0.30. Use 'C' for cost and 't' for toppings.
  - a) Determine the formula for this relation.
  - b) What is the cost of the basic hotdog (no toppings)?
  - c) Determine the cost for a hot dog with 10 toppings !
  
2. The cost to rent a car from **Kyle's Kars** to drive 120 km is \$38. The cost per kilometre is \$ 0.15. Use 'C' for cost and 'd' for distance.
  - a) Determine the formula for this relation.
  - b) What is the initial charge for renting the car?
  - c) Determine the cost for driving the rented car for 436 km.
  
3. The cost of **Nicole's** cellphone bill for last month was \$57.50 for 650 minutes of usage. She was charged \$0.05 per minute for each minute that she was on the phone. Use 'C' for cost and 'm' for minutes.
  - a) Determine the formula for this relation.
  - b) What was the basic cost of renting the phone?
  - c) Determine the cost if she talked for 1450 minutes.
  
4. The cost of a pizza at **Pat's Pizza Place** depends on the number of toppings. Two points in the relation are (3 , \$4.20) and (9, \$6.60). 'C' is cost and 't' is number of toppings.
  - a) Determine the rate per topping.
  - b) Determine the initial charge.
  - c) Now write the formula for calculating the cost of a pizza using answers from a and b..
  
5. A handglider descends from a cliff. Its height is a function of time. After 3 minutes its height above land is 320 metres and after 7 minutes its height is 80 metres. 'h' is height and 't' is time.
  - a) Determine the formula for calculating height at any given time.
  - b) What is the rate of descent?
  - c) State the initial height on the cliff.
  
6. The cost of a cellphone bill for the month in Greece depends on the number of minutes used. 450 minutes costs \$75 and 920 minutes costs \$122. 'C' is cost and 'd' is distance traveled.
  - a) Write the formula for calculating the monthly cost or having a cellphone.

## LINEAR RELATIONS

1a)  $C = 0.30t + b$   
 $3.25 = 0.30(5) + b$   
 $3.25 = 1.50 + b$   
 $b = 3.25 - 1.50$   
 $= 1.75$

$\therefore C = 0.30t + 1.75$

b)  $C = 0.30(0) + 1.75$   
 $= 1.75$

$\therefore$  A BASIC HOTDOG COSTS \$1.75

c)  $C = 0.30(10) + 1.75$   
 $= 3.00 + 1.75$   
 $= 4.75$

$\therefore$  A HOTDOG w/ 10 TOPPINGS COSTS \$4.75

2a)  $C = 0.15d + b$   
 $38.00 = 0.15(120) + b$   
 $38.00 = 18.00 + b$   
 $b = 38.00 - 18.00$   
 $= 20.00$

$\therefore C = 0.15d + 20.00$

b)  $C = 0.15(0) + 20.00$   
 $= 20.00$

$\therefore$  THE INITIAL COST OF RENTING A CAR IS \$20

c)  $C = 0.15(436) + 20.00$   
 $= 65.40 + 20.00$   
 $= 85.40$

$\therefore$  IT COSTS \$85.40 TO DRIVE 436 KM

3a)  $C = 0.05m + b$   
 $57.50 = 0.05(650) + b$   $\therefore C = 0.05m + 32.50$

$b = 32.50$

b)  $C = \$32.50$

$\therefore$  THE BASE COST IS \$32.50

c)  $C = 0.05(1450) + 32.50$   
 $= \$72.50$

$\therefore$  IT COSTS \$72.50 FOR 1450 MW

4a)  $m = \frac{C_2 - C_1}{t_2 - t_1} = \frac{8.60 - 4.20}{9 - 3} = \frac{2.40}{6} = 0.40$

c)  $C = 0.40t + b$

$4.20 = 0.40(3) + b$

$b = 3.00$

b)  $C = \$3.00$

$\therefore$  INITIAL COST IS \$3

5a)  $m = \frac{h_2 - h_1}{t_2 - t_1} = \frac{80 - 320}{7 - 3} = \frac{-240}{4} = -60$

$h = -60t + b$

$80 = -60(7) + b$

$b = 500$

b) RATE OF DESCENT IS -60 m/min

c) INITIAL HEIGHT OF CLIFF IS 500m

6a)  $m = \frac{C_2 - C_1}{n_2 - n_1} = \frac{122 - 75}{920 - 450} = \frac{47}{470} = 0.10$

$C = 0.10n + b$

$75 = 0.10(450) + b$

$b = 75 - 45$

$= 30$

$\therefore C = 0.10n + 30.00$