Graphic Algebra Linear Functions

After page 4

CAS home screen

Define $P(x) = 2x - 3$

TI-89   *Select* F4, define

Alpha ⬆ P(x) = 2*x-3

Similarly define $Q(x) = 2.5*x - 5$

Now let's double check some calculations just to practise using this home screen.

3(CAS) How much profit will Kate make *given* that she sells 2.6 litres?

The CAS instruction for this calculation can be given in several ways.

Try each of the following:

2.5*x-5 | x=2.6

Q(x) | x=2.6

Q(2.6)

Note that you should get the same answer for each method as you are just substituting the value of 2.6 for x.

4 (CAS) Now check your answers to **4 a** and **4 b**

    4 c Angela and Kate each want to make $10.00 profit

To check how many litres Angela must sell you need to solve the equation P(x)=10

select F2 , Solve

Complete the instruction

Solve(10=2*x-3,x)

OR

Solve (P(x)=10,x)

Either instruction should give the same answer.

Edit your Solve command so that it reads Solve (Q(x)=10,x) and press Enter to find how much Kate must sell. The final x in the bracket indicates which variable will be found. This is important in later work.

5 (CAS) (i) To find the value of x at the intersection point solve(P(x)=Q(x),x)

(ii) Given the answer to (i) as the value of x find the value of $P(x)$.

	P(x)	x=*the answer from (i).* *To paste the answer from the previous question, retype or scroll up the screen and press ENTER once you have highlighted the required equation.*

(iii) If x is equal to the value found in (i) above, what will be the value of $Q(x)$? Check by using your CAS to substitute this value for x into $Q(x)$.

after page 6/ in parallel with page 6

Mobile phone charges

2 (CAS)   Define the rule for *A*(*m*) using the CAS.

Check your rule fits with the values you have written into your table.

(To do this you could use the CAS instructions A(m)| m =20, then A(m)| m =30, etc or you can enter A(m)| m = {20,30,40,50})

Define rules for B(m) and C(m) in the CAS

In a similar way, use the substitution feature of CAS to check your rules for *B*(*m*) and *C*(*m*) using the known values in your table.

3 b (CAS) Use the home screen to find the values of the call charge and monthly cost at the point of intersection between *A*(*m*) and *B*(*m*)

solve (A(m)=B(m),m)

A(m) | m= *the previous answer*

and B(m) | m= *the same value of m used above*

Now check the call charge and monthly cost for each of the other intersection points.

7 (CAS) after page 16.

7 a CAS (i) Define in the CAS the function $f(x) = k*x + 2$. Different numbers substituted
for k will give different functions.
Graph the function $f(x)$ for several values of k. For example: if you choose k=4,
k= -4, and k=0, graph these functions by entering:
y1 = f(x) | k=4, y2 = f(x) | k=4, and y3 = f(x) | k=4.

(ii) Select some values for k to make an interesting creation with functions of the
form $f(x) = kx + 2$. Write down the function and values of k you have chosen,
sketch the creation and name it.
All of the functions in (i) above pass through one common point. Give the co-
ordinates of the point and explain why the functions have this property.

7 b CAS Redefine the function $f(x) = k-x$. This will change the function in y1, y2 etc, but
not the values of k that you previously entered. The graphs of the new functions
will be drawn when the graph window is refreshed. Make an interesting creation
using these new functions with different values of k. Write down the function
and values of k you have chosen, sketch the creation and name it.

7 c CAS Define the function $f(x) = kx-k$. Make an interesting creation with these
functions using different values of k. Write down the function and values of k
you have chosen, sketch the creation and name it.

7 d CAS Select some values for k to make an interesting creation with functions of the
form $f(x) = kx + k + 4$. Write down the values, and sketch your creation.
Write down an interesting property of your creation. Explain this occurs.