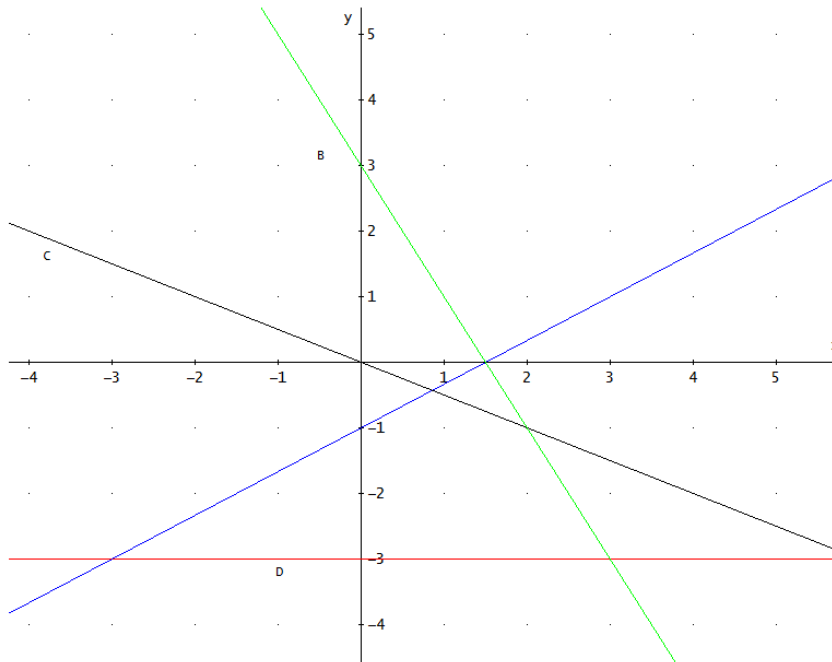


EXAM 3\_1 (Functions)

1. Find the equations of the following lines. (1,5 points)



2. Jeff sets up his own business as a plumber. (2 points)

0707 874561  
24 hr

**PLUMBING**



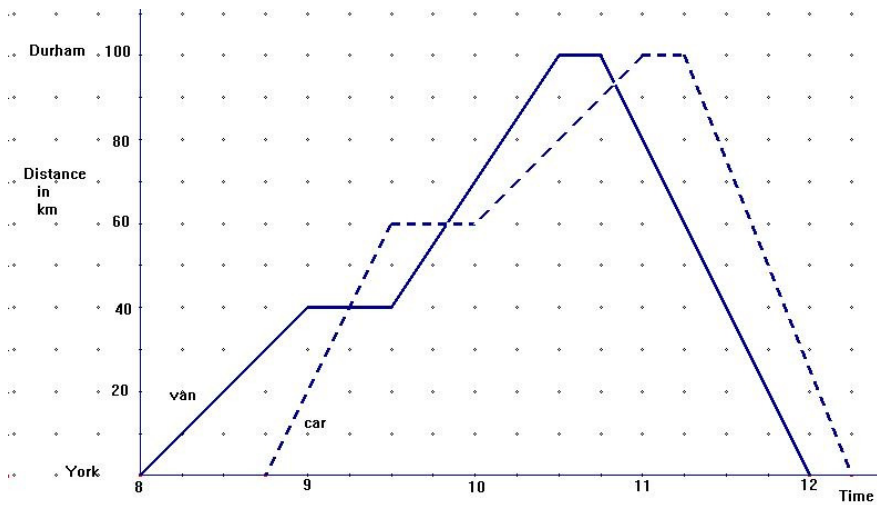
Call out **£ 18** plus **£ 15** per hour

Copy and complete the table where  $C$  stands for this total charge and  $h$  stands for the number of hours he works.

Draw a graph with  $h$  across the page and  $C$  up the page.

- Use your graph to find how long he worked if his charge was £ 55.50.
- What is the equation connecting  $C$  and  $h$ ?

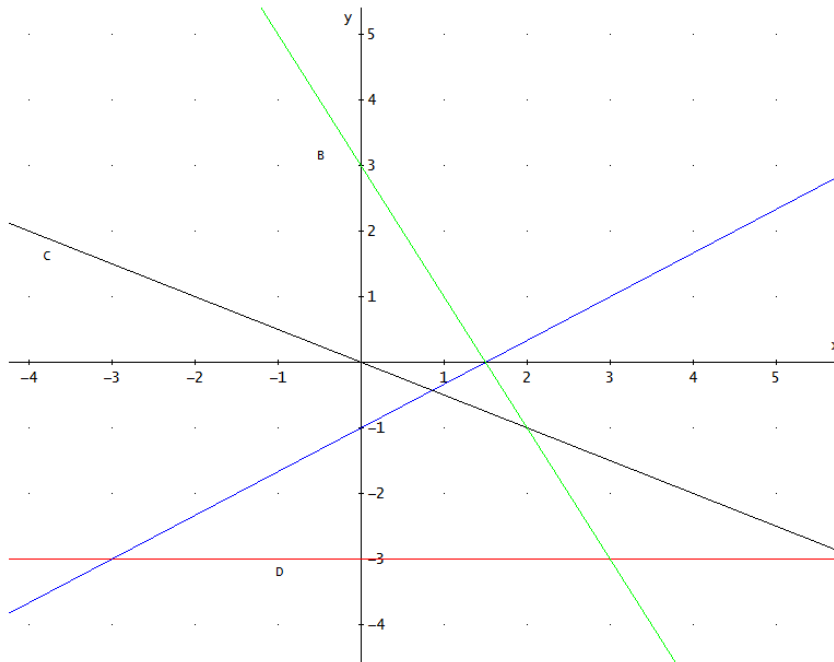
3. The graph shows the journeys made by a van and a car starting at York, travelling to Durham and returning to York. (1,5 points)



- For how long was the van stationary during the journey?
  - At what time did the car first overtake the van?
  - At what speed was the van travelling between 09:30 and 10:00?
  - What was the greatest speed attained by the car during the entire journey?
  - What was the average speed of the car over its entire journey?
4. Solve by graphing and using another method the simultaneous equation
- $$\left. \begin{array}{l} y = 1 - 3(x + 2) \\ 2x + y + 3 = 0 \end{array} \right\} \quad (2 \text{ points})$$
5. Work out the equations of the following lines and sketch them (3 points):
- The line joining these points: A(-3,6), B(5,0).
  - The line passes through (3,-1) and a slope of  $-\frac{1}{3}$ .
  - The line passes through (2,-4) and cuts the y-axis in 2.
  - The line parallel to the x-axis and passes through in the point (-2,-3).

SOLUTION

1. Find the equations of the following lines.



A)  $y = \frac{2}{3}x - 1$

B)  $y = -2x + 3$

C)  $y = -\frac{1}{2}x$

D)  $y = -3$

2. Jeff sets up his own business as a plumber.

0707 874561  
24 hr

# PLUMBING

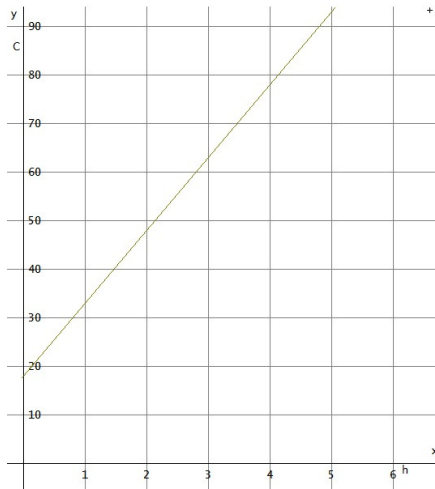


Call out **£ 18** plus **£ 15** per hour

Copy and complete the table where **C** stands for this total charge and **h** stands for the number of hours he works.

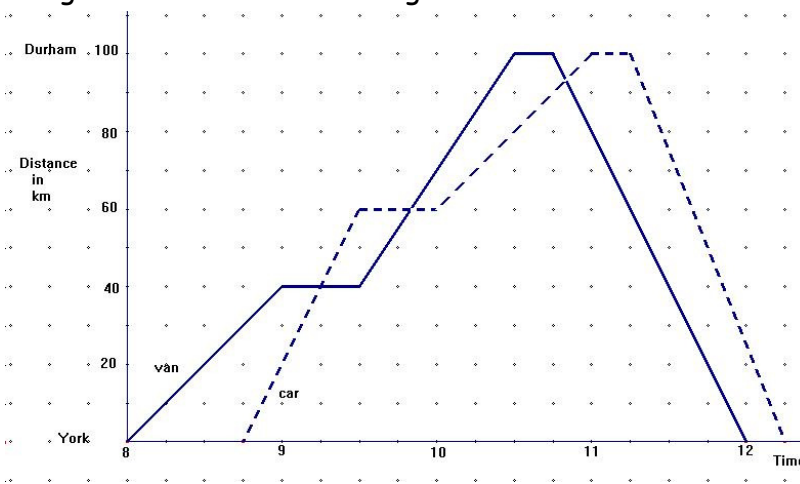
h	1	2	3	4	5
C	33	48	63	78	93

Draw a graph with **h** across the page and **C** up the page.



- a) Use your graph to find how long he worked if his charge was £ 55.50. 2.5 hours
- b) What is the equation connecting  $C$  and  $h$ ?  
 $C = 18 + 15h \rightarrow y = 15x + 18$

3. The graph shows the journeys made by a van and a car starting at York, travelling to Durham and returning to York.

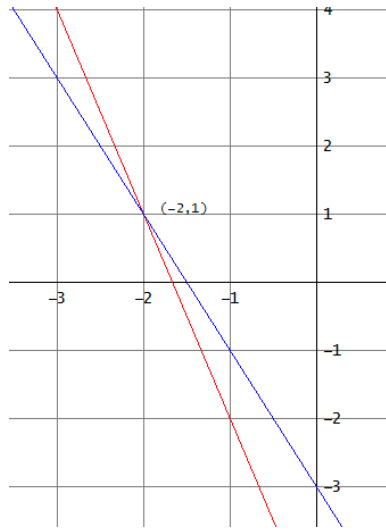


- a) For how long was the van stationary during the journey? 45 minutes
- b) At what time did the car first overtake the van? At 9:15
- c) At what speed was the van travelling between 09:30 and 10:00? 60km/h
- d) What was the greatest speed attained by the car during the entire journey? 100 km/h
- e) What was the average speed of the car over its entire journey?  
73,3km/h

4. Solve by graphing and using another method the simultaneous equation

$$\left. \begin{array}{l} y = 1 - 3(x + 2) \\ 2x + y + 3 = 0 \end{array} \right\} \text{By graphing: } \begin{cases} y = -3x - 5 \\ y = -2x - 3 \end{cases}$$

By substitution:



$$\begin{cases} y = -3x - 5 \\ y = -2x - 3 \end{cases} \rightarrow -3x - 5 = -2x - 3$$

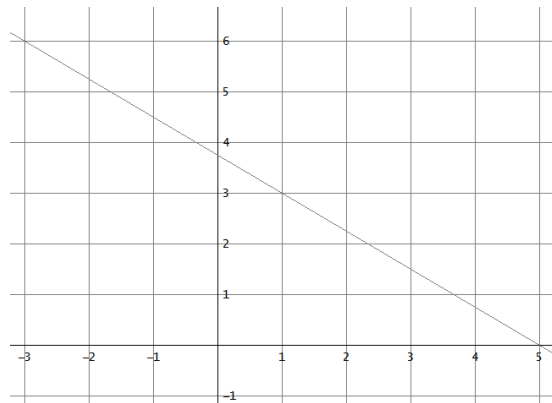
$$-3x + 2x = -3 + 5 \rightarrow -x = 2 \rightarrow x = -2$$

$$x = -2 \rightarrow y = 1 \rightarrow \text{Solution : } (-2, 1)$$

5. Work out the equations of the following lines and sketch them :

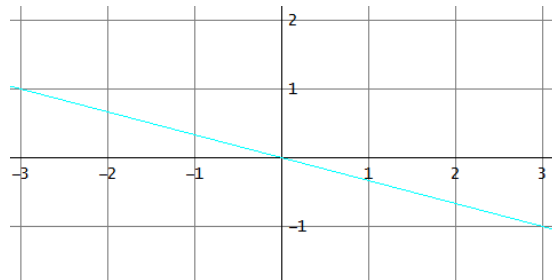
a) The line joining these points: A(-3,6), B(5,0).

$$m = \frac{0-6}{5+3} = -\frac{3}{4} \rightarrow y-0 = -\frac{3}{4}(x-5) \rightarrow y = -\frac{3}{4}x + \frac{15}{4}$$



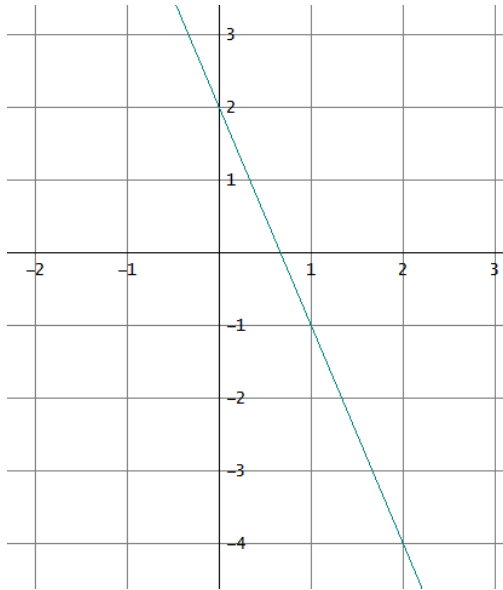
b) The line passes through (3,-1) and a slope of  $-\frac{1}{3}$ .

$$y+1 = -\frac{1}{3}(x-3) \rightarrow y = -\frac{1}{3}x + 1 - 1 \rightarrow y = -\frac{1}{3}x$$



c) The line passes through (2,-4) and cuts the y-axis in 2.

$$n = 2 \rightarrow y = mx + 2 \rightarrow -4 = 2m + 2 \rightarrow m = -3 \rightarrow y = -3x + 2$$



- d) The line parallel to the x-axis and passes through in the point  $(-2,-3)$ .  
 $m = 0 \rightarrow y = -3$

