UNIT 28 *Straight Lines* CSEC Revision Test

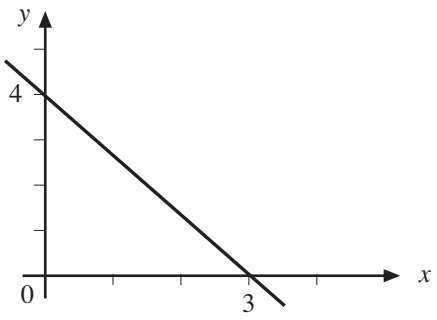
1. The line segment BC passes through the point A $(-5, 3)$ and has a gradient of $\frac{2}{5}$.

   (a) Express the equation of the line segment BC in the form $y = mx + c$. *(3 marks)*

   (b) Show that BC is parallel to the line $2x - 5y = 1$. *(2 marks)*

   (CXC)

2.



The graph shows part of the straight line defined by $y = mx + c$.

Find the values of

(a) m, *(2 marks)*

(b) c. *(1 mark)*

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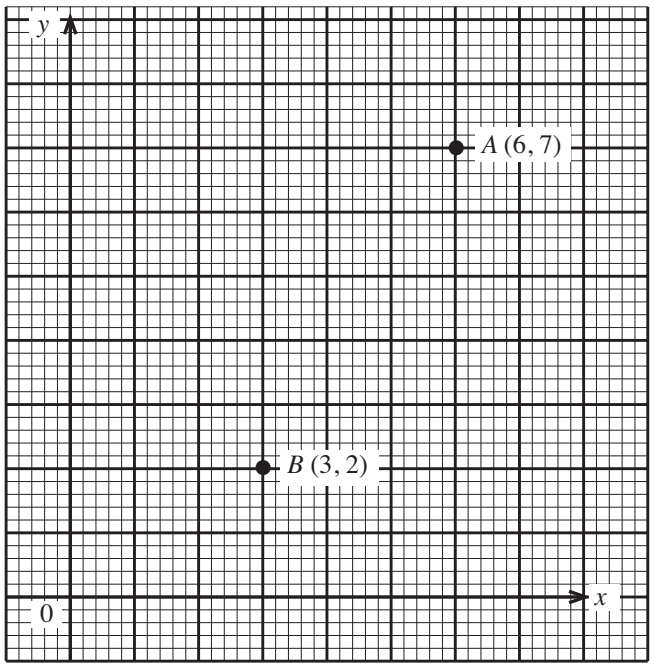
3.



The diagram above, shows two points A (6, 7) and B (3, 2).

(a) Calculate the gradient of AB. *(2 marks)*

(b) Determine the equation of the line AB. *(2 marks)*

(c) Obtain the value of x if a point $P\ (x, -6)$ lies on AB. *(2 marks)*

(CXC)

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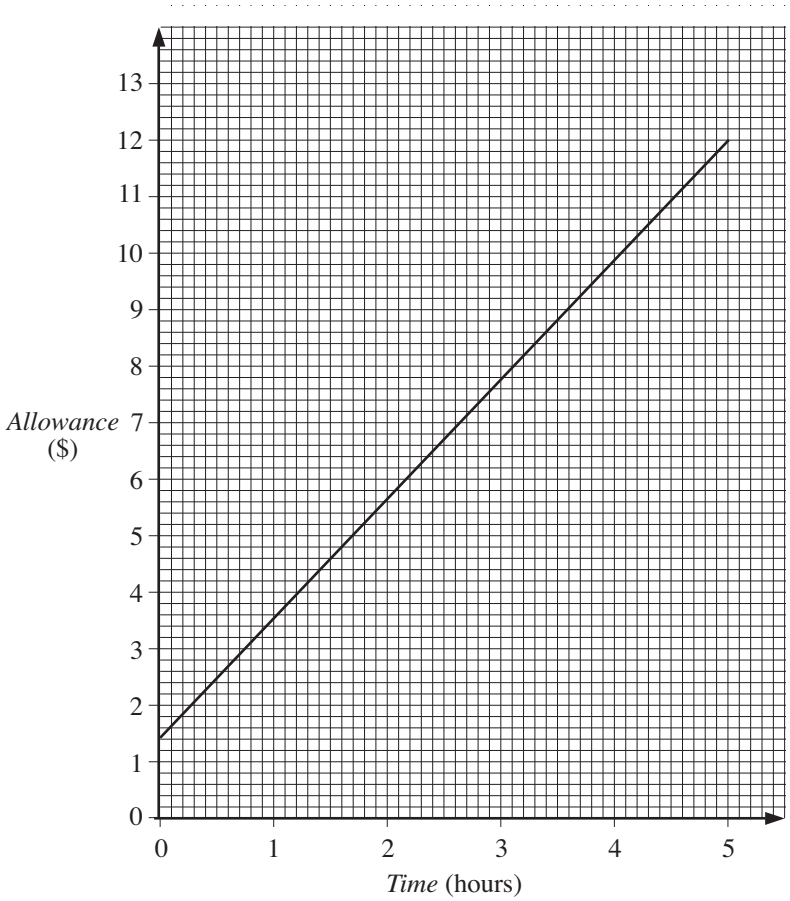
4. Janice's parents pay her a weekly allowance. The allowance includes a fixed amount, plus an extra amount for any work which she does in their shop. The graph shows the connection between her allowance and the time she spends working.



(a) What is Janice's allowance when she works for 3 hours? *(1 mark)*

(b) One week her allowance was \$10.20. For how many hours did she work during that week? *(2 marks)*

(c) What is the fixed amount that she receives before doing any work? (*1 mark*)

(d) Vijay's parents give him no fixed amount, but they pay him \$2.90 per hour for working.

(i) Complete the table for Vijay.

Number of hours of work	0	1	2	3
Allowance (£)	0.00	2.90		

(1 mark)

(ii) One week Vijay and Janice both worked for the same time and both received the same amount of money,

Use the values in this table to find how many hours they each worked.

(2 marks)

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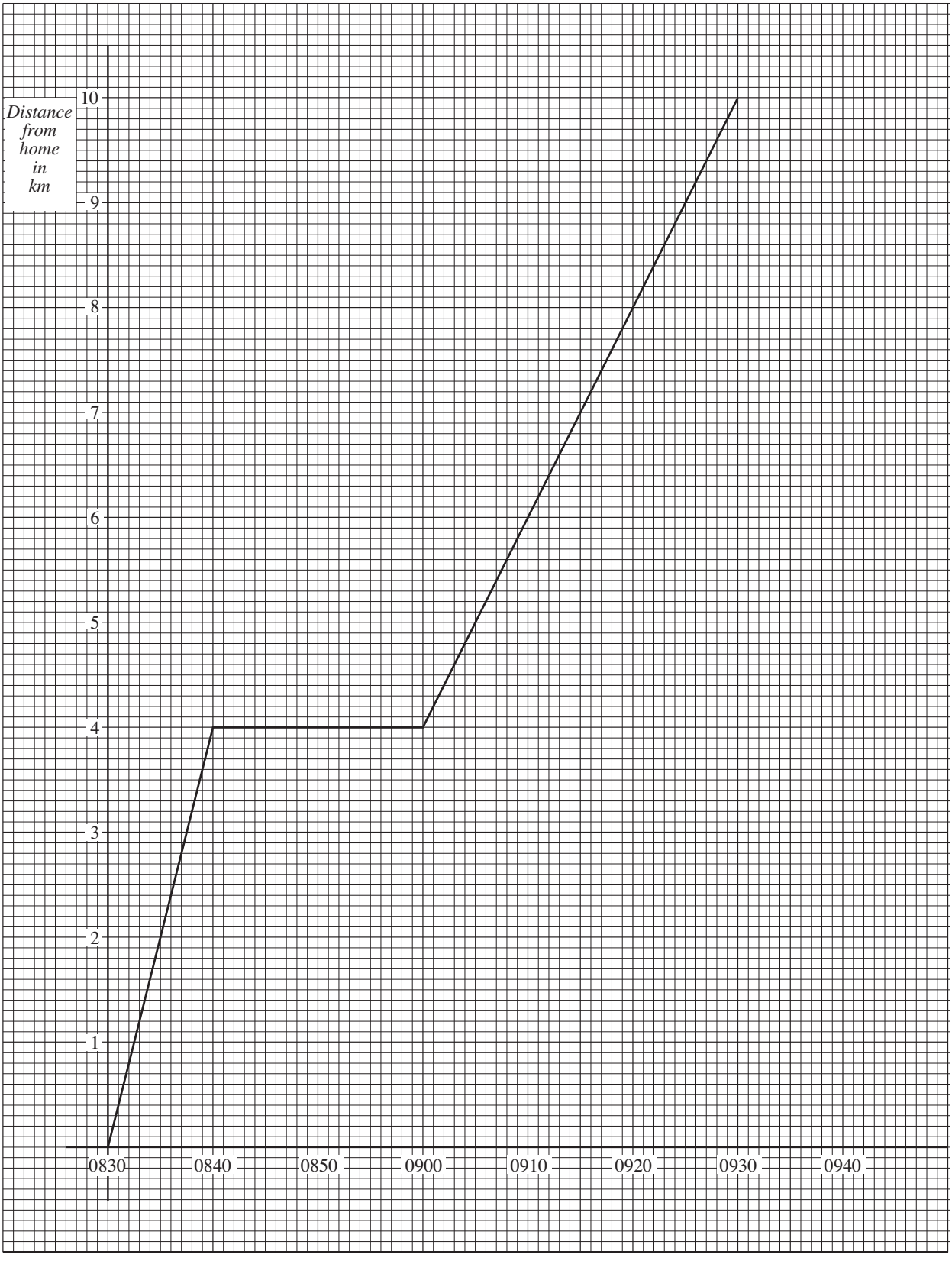
5. The graph represents the journey made by a lecturer travelling from home to college on a Monday morning.



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(a) Use the graph to find

(i) the distance travelled by the lecturer, *(1 mark)*

(ii) the time taken for his journey. *(1 mark)*

(b) Explain what might have happened between 0840 and 0900 on this journey, *(2 marks)*

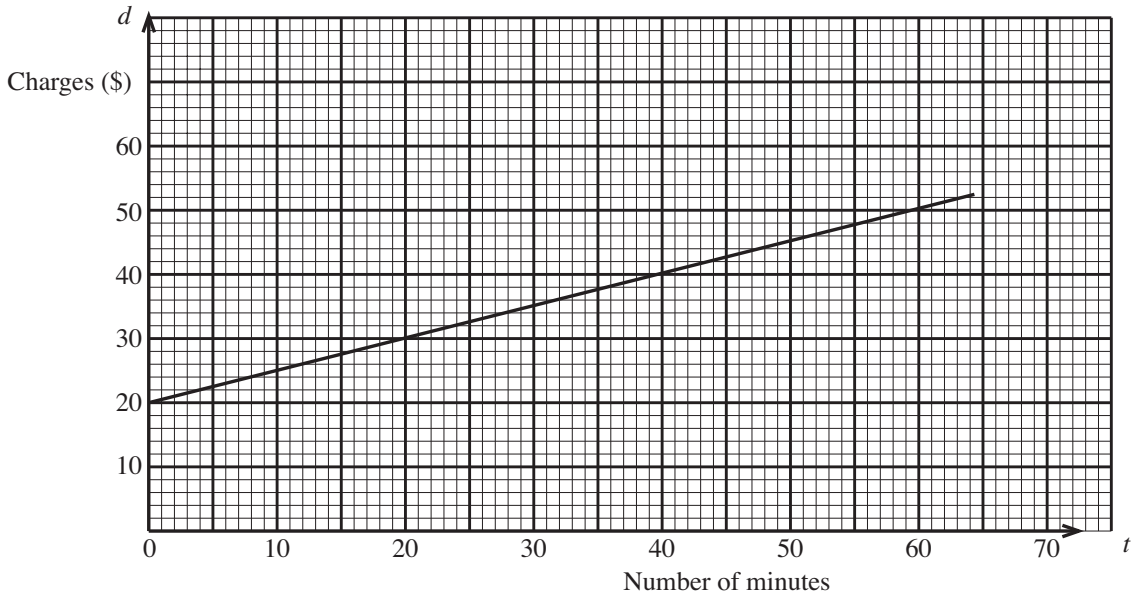
(c) On Tuesday he left home at 0840 and travelled at a constant speed to arrive at college at 0910.

(i) On a copy of the graph draw a line to represent his journey on Tuesday. *(2 marks)*

(ii) Calculate in kilometres per hour the average speed for his journey on Tuesday. *(3 marks)*

6. The amount a plumber charges for services depends in the time taken to complete the repairs plus a fixed charge.

The graph below shows the charges in dollars (d) for repairs in terms of the number of minutes (t) taken to complete the repairs.



(a) What was the charge for a plumbing job which took 20 minutes? *(1 mark)*

(b) How many minutes were spent completing repairs that cost:

(i) $38.00

(ii) $20.00 ? *(2 marks)*

(c) What is the amount of the fixed charge? *(1 mark)*

(d) Calculate the gradient of the line. *(2 marks)*

(e) write down the equation of the line in terms of d and t. *(2 marks)*

(f) Determine the length of time taken to complete a job for which the charge was $78.00. *(3 marks)*

(CXC)

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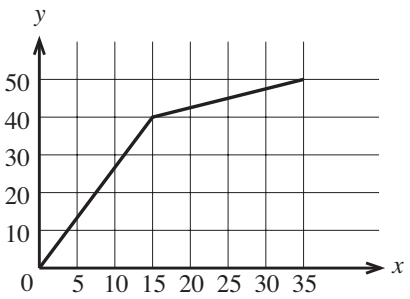
7. The speed-time graph below shows the movement of a cyclist.



Using the graph, calculate

(a) the acceleration of the cyclist during the first 15 seconds.

(b) the distance travelled by the cyclist between the period $t = 15$ and $t = 35$ seconds.

(6 marks)
(CXC)

8. A line has equation $y = -2x + 3$. A second line is parallel to this line. Determine the equation of this line if it passes through the point with coordinates $(-3, 4)$.

(3 marks)
(CXC)

TOTAL MARKS: 50

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ANSWERS

1. (a) $y = \frac{2}{5}x + c$ M1 A1

$3 = -2 + c \Rightarrow c = 5$ A1

$y = \frac{2}{5}x + 5$

(b) $y = \frac{2}{5}x - 1$ so gradients equal and hence parallel M1 A1 *(5 marks)*

2. (a) $m = -\frac{4}{3}$ M1 A1

(b) $c = 4$ B1 *(3 marks)*

3. (a) Gradient $= \frac{7-2}{6-3} = \frac{5}{3}$ M1 A1

(b) $y = \frac{5}{3}x + c$ M1

$2 = \frac{5}{3} \times 3 + c \Rightarrow c = -3$ A1

$y = \frac{5}{3}x - 3$

(c) $-6 = \frac{5}{3}x - 3 \Rightarrow x = -\frac{9}{5}$ M1 A1 *(6 marks)*

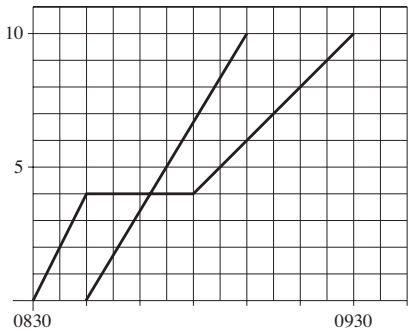
4. (a) \$7.80 (b) 4 hours (c) \$1.40 B1 B2 B1

(d) (i)

2	3
5.80	8.70

(ii) 2 hours B1 B2 *(7 marks)*

5. (a) (i) 10 km (ii) 60 mins (b) stopped (shopping?) B1 B1 B2
(any reasonable explanation)

(c) (i) 

(ii) 20 km/hour B2 M2 A1 *(9 marks)*

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ANSWERS

6. (a) \$30 B1

(b) (i) 35 mins (ii) 0 mins B1 B1

(c) \$20 B1

(d) Gradient $= \frac{50 - 20}{60} = \frac{1}{2}$ M1 A1

(e) $d = 20 + \frac{1}{2}t$ B2

(f) $78 = 20 + \frac{1}{2}t \Rightarrow \frac{1}{2}t = 58 \Rightarrow t = 116$ mins M1 A1 A1 *(11 marks)*

7. (a) Acceleration = gradient $= \frac{40}{15} = \frac{8}{3}$ m/s^2 M1 A1 A1

(b) Distance travelled $= \frac{1}{2} \times 20 \times 10 + 20 \times 40 = 100 + 800$

$= 900$ m M1 A1 A1 *(6 marks)*

8. $y = -2x + c$ B1

$4 = -2(-3) + c \Rightarrow c = -2$ M1 A1

$y = -2x - 2$ *(3 marks)*

TOTAL MARKS: 50