



eClassroom

GCSE Mathematics

Linear Graphs

Worked Solutions

Pearson Edexcel GCSE & iGCSE Mathematics



Section A — Foundation — Worked Solutions

[Fluency] Question 1

Plot: $x=-3 \rightarrow y=-5$, $x=0 \rightarrow y=1$, $x=3 \rightarrow y=7$. Draw straight line.

\therefore **Line through $(-3,-5), (0,1), (3,7)$ ✓**

[Fluency] Question 2

Plot: $x=0 \rightarrow y=4$, $x=4 \rightarrow y=0$. Straight line.

\therefore **Line through $(0,4), (4,0)$ ✓**

[Fluency] Question 3

$y=4x-3$: gradient=4, y-intercept=-3

\therefore **Gradient=4, y-intercept=-3**

[Fluency] Question 4

$$m = \frac{13-5}{6-2} = \frac{8}{4} = 2$$

\therefore **m=2**

[Fluency] Question 5

$$y=3x-2$$

\therefore **y=3x-2**

[Reasoning] Question 6

(a) Both gradient=2 \rightarrow parallel

(b) $3 \times (-1/3) = -1 \rightarrow$ perpendicular

(c) Gradients 4 and 2 — neither

\therefore **(a) Parallel (b) Perpendicular (c) Neither**

[Reasoning] Question 7

$$m = \frac{11-5}{3-1} = 3 \quad 5 = 3(1) + c \Rightarrow c = 2$$

\therefore **m=3, c=2; y=3x+2**



**[Reasoning] Question 8**

- (a) $C=2m+3$
(b) Straight line through (0,3) with gradient 2
(c) Gradient=2 means cost increases by £2 per mile
 \therefore (a) $C=2m+3$ (c) Cost per mile

[Problem Solving] Question 9

$$m = \frac{0-4}{5-0} = -\frac{4}{5} \quad y = -\frac{4}{5}x + 4$$

\therefore

[Problem Solving] Question 10

$$3x-2=x+4 \rightarrow 2x=6 \rightarrow x=3, y=7$$

\therefore (3,7)





Section B — Higher — Worked Solutions

[Fluency] Question 1

$$m = \frac{13-5}{6-2} = 2 \quad c = 5 - 4 = 1$$

$$\therefore y=2x+1$$

[Fluency] Question 2

$$m_{\perp} = -\frac{1}{3} \quad y = -\frac{x}{3} + 2$$

\therefore

[Fluency] Question 3

Parallel \rightarrow same gradient $m=5$. Through $(1,4)$: $4=5(1)+c \rightarrow c=-1$

$$\therefore y=5x-1$$

[Reasoning] Question 4

$$m_1 = \frac{9-3}{4-1} = 2 \quad m_2 = \frac{7-1}{3-0} = 2$$

Both gradients=2 \rightarrow parallel \checkmark

$$\therefore \text{Both gradients} = 2 \rightarrow \text{parallel } \checkmark$$

[Reasoning] Question 5

$$(a) 2y = 12 - 3x \Rightarrow y = -\frac{3}{2}x + 6$$

(b) Gradient= $-3/2$, y-intercept=6

(c) x-intercept: $0=-3x/2+6 \rightarrow x=4$

$$\therefore (a) y=-3x/2+6 \quad (b) m=-3/2, c=6 \quad (c) x=4$$

[Reasoning] Question 6

$$y - 4 = -2(x - 3) \Rightarrow y = -2x + 10 \Rightarrow 2x + y - 10 = 0$$

$$\therefore 2x+y-10=0$$





[Problem Solving] Question 7

(a) $V=200-15t$

(b) Gradient= -15 : tank loses 15 litres/minute

(c) $200-15t=0 \rightarrow t=13.3$ min

\therefore (a) $V=200-15t$ (b) -15 litres/min (c) 13.3 min

[Problem Solving] Question 8

$$AB: m = \frac{0-2}{4-0} = -\frac{1}{2}, y = -\frac{x}{2} + 2$$

$$BC: m = \frac{6-0}{2-4} = -3, y = -3x + 12$$

$$CA: m = \frac{2-6}{0-2} = 2, y = 2x + 2$$

Check $AB \perp BC$: $m_{AB} \times m_{BC} = (-1/2) \times (-3) = 3/2 \neq -1$

Check $AB \perp CA$: $(-1/2) \times 2 = -1 \checkmark \rightarrow$ angle at $A=90^\circ$

Check $BC \perp CA$: $(-3) \times 2 = -6 \neq -1$

Correction: $\angle ABC$: vectors $BA=(-4,2)$, $BC=(-2,6)$. Dot= $8+12=20 \neq 0$

So $\angle ABC$ is not 90° . Check which angle is 90° : A is the right angle.

\therefore (b) $AB \perp CA$ ($m \times m = -1$) \rightarrow right angle at A \checkmark