

Calculator Overlap questions June 18 Paper 2

20/1 (a) Simplify $m^3 \times m^4$

..... m^7 (1)

(b) Simplify $(5np^3)^3$

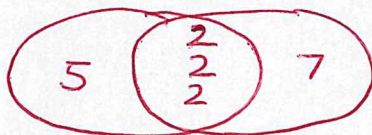
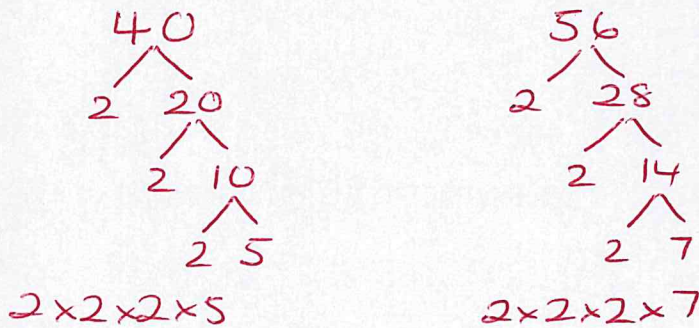
$5np^3 \times 5np^3 \times 5np^3$

..... $125n^3 p^9$ (2)

(c) Simplify $\frac{32q^9 r^4}{4q^3 r}$

..... $8q^6 r^3$ (2)

21/2 (a) Find the lowest common multiple (LCM) of 40 and 56



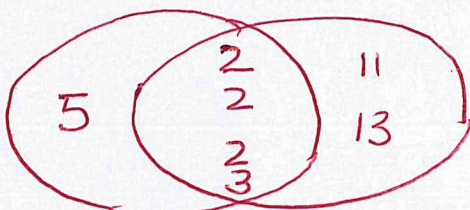
LCM = everything

..... $LCM = 2 \times 2 \times 2 \times 5 \times 7$ (2)

$A = 2^3 \times 3 \times 5$ $B = 2 \times 3 \times 52$

(b) Write down the highest common factor (HCF) of A and B.

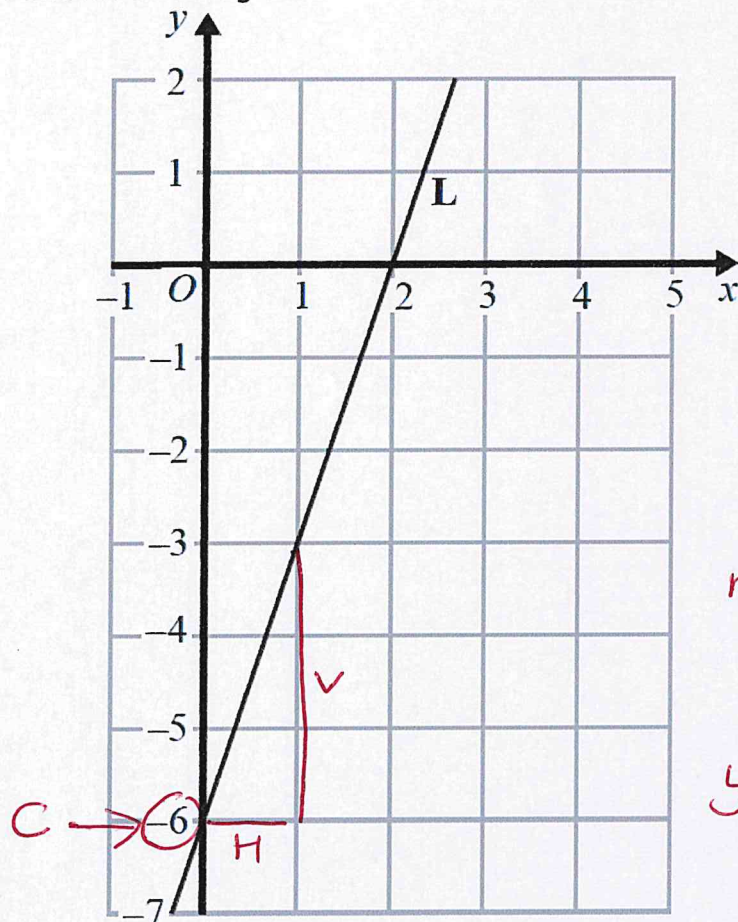
$B = 2 \times 11 \times 3 \times 2 \times 26$
 $= 2 \times 11 \times 3 \times 2 \times 2 \times 13$
 $= 2 \times 2 \times 2 \times 3 \times 11 \times 13$



HCF = intersection

..... $HCF = 2 \times 2 \times 2 \times 3$ (1)

22/3 The line L is shown on the grid.



$$m = \frac{v}{H} = \frac{3}{1} = 3$$

$$y = mx + c$$

Find an equation for L.

$$y = 3x - 6$$

(Total for Question 22/3 is 3 marks)

23/4 Raya buys a van for £8500 plus VAT at 20%.
 Raya pays a deposit for the van.
 She then pays the rest of the cost in 12 equal payments of £531.25 each month.
 Find the ratio of the deposit Raya pays to the total of the 12 equal payments.
 Give your answer in its simplest form.

$$\begin{aligned} \text{Total cost} &= 8500 + 20\% \\ &= 8500 + 1700 = \underline{\underline{\pounds 10200}} \end{aligned}$$

$$\text{Payments} = 12 \times 531.25 = \underline{\underline{\pounds 6375}}$$

$$\text{Deposit} = 10200 - 6375 = \underline{\underline{\pounds 3825}}$$

$$D : P$$

$$3825 : 6375$$

$$3 : 5$$

$$3 : 5$$

$$\frac{3825}{6375} = \frac{3}{5}$$

24/5 (a) Complete the table of values for $y = x^2 - x - 6$

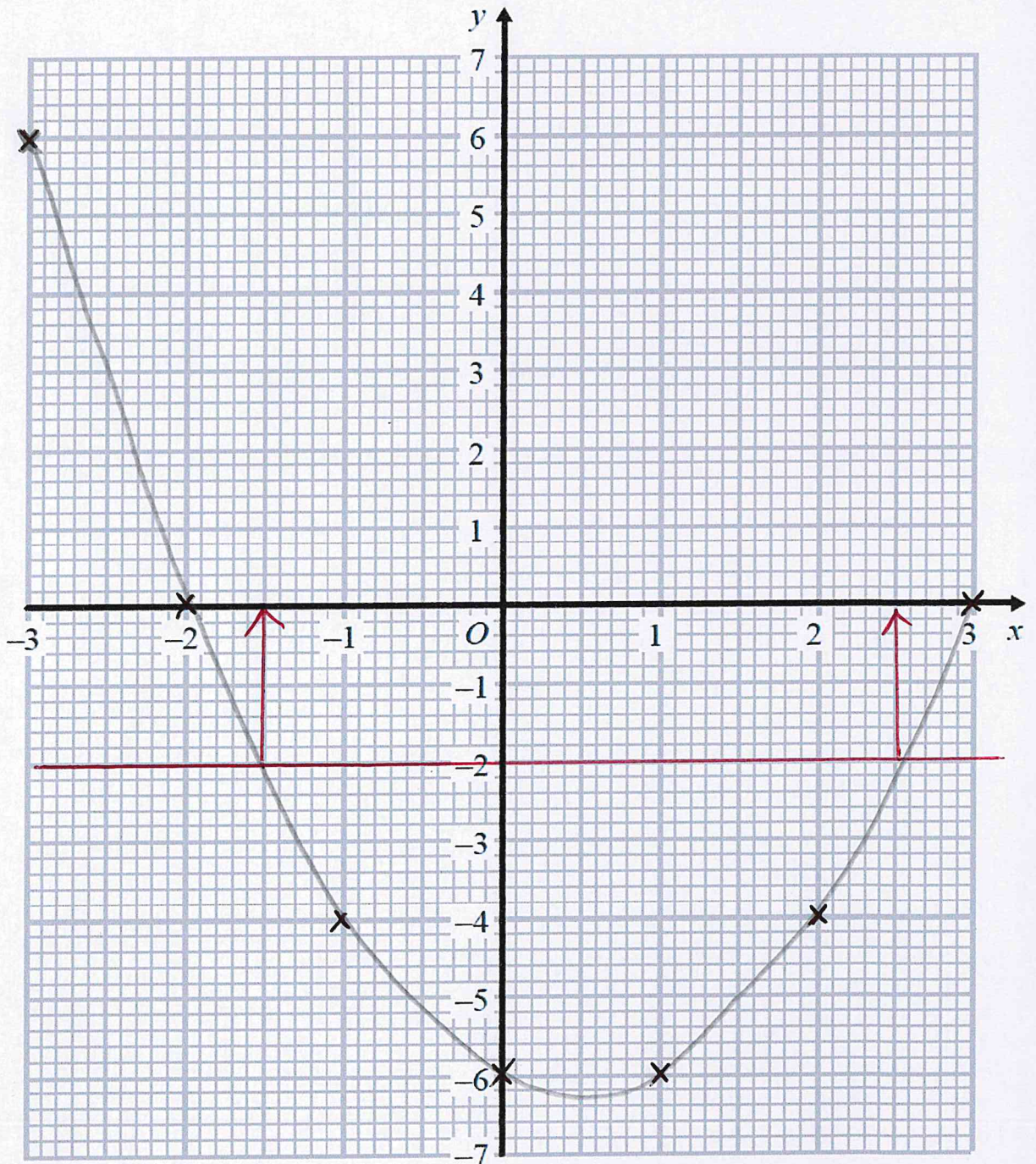
x	-3	-2	-1	0	1	2	3
y	6	0	-4	-6	-6	-4	0

$(-3, 6)$ $(-2, 0)$ $(-1, -4)$ $(0, -6)$ $(1, -6)$ $(2, -4)$ $(3, 0)$

(2)

(b) On the grid, draw the graph of $y = x^2 - x - 6$ for values of x from -3 to 3

(2)



(c) Use your graph to find estimates of the solutions to the equation $x^2 - x - 6 = -2$

$x = -1.5$ and $x = 2.5$

25/6 A force of 70 newtons acts on an area of 20 cm²

The force is increased by 10 newtons.

The area is increased by 10 cm²

Helen says, "The pressure decreases by less than 20%"

Is Helen correct?

You must show how you get your answer.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

$$\text{Start Pressure} = \frac{F}{A} = \frac{70}{20} = \underline{3.5}$$

$$\text{Finish Pressure} = \frac{F}{A} = \frac{80}{30} = \frac{8}{3} = \underline{2.6\dot{6}}$$

20% reduction from 3.5

$$10\% = 0.35$$

$$20\% = \underline{0.70}$$

$$= 3.5 - 0.70$$

$$= \underline{2.80}$$

Helen is wrong. The pressure is reduced by more than 20%.

(3)