

- 1 (a) It is given that  $N = 0.\dot{5}\dot{7}$ .

Show that  $99N = 57$ .

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.....

.....

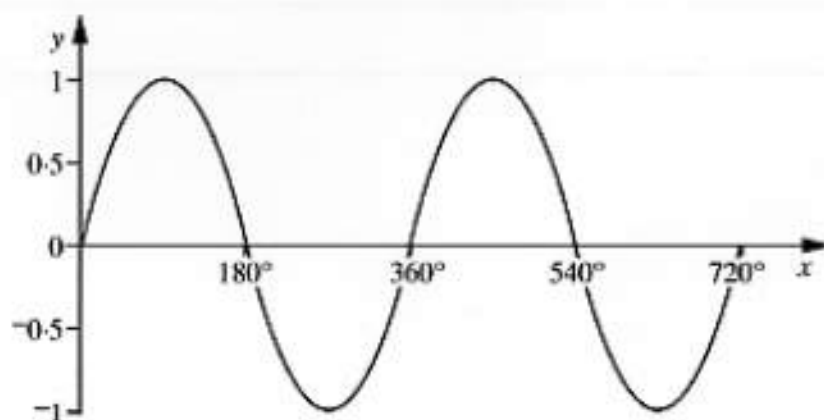
.....[2]

- (b) Hence express  $0.\dot{5}\dot{7}$  as a fraction in its lowest terms.

(b) .....[2]

4

2



The diagram shows the graph  $y = \sin x$  for  $0^\circ \leq x \leq 720^\circ$ .

The value  $x = 30^\circ$  satisfies the equation  $\sin x = 0.5$ .

Find the 3 other values of  $x$  which satisfy  $\sin x = 0.5$  for  $0^\circ \leq x \leq 720^\circ$ .

.....[2]

2

[Turn over

3 Simplify.

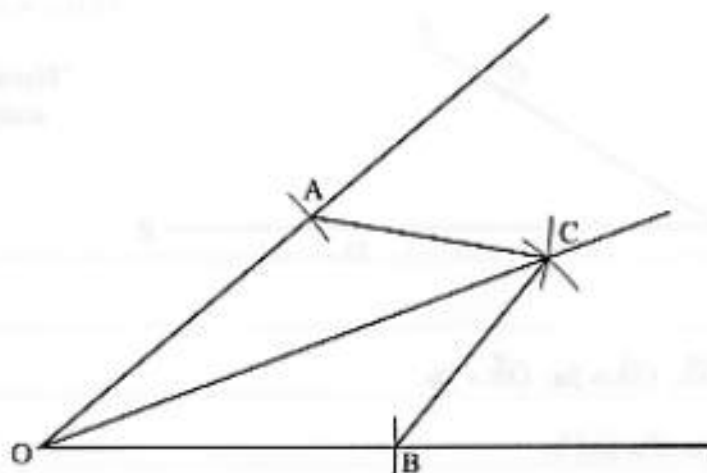
(a)  $\frac{3}{x-1} - \frac{2}{x+1}$

(a) ..... [3]

(b)  $\frac{x^2 - 9}{x^2 + x - 12}$

(b) ..... [3]

6



By proving two triangles congruent show that angle AOC = angle BOC.

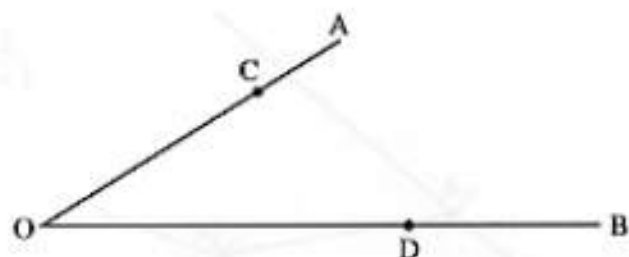
[3]

..[3]

3

5

6

Not to  
scale

In the diagram,

$$\vec{OC} = 2\vec{CA}, \quad \vec{OD} = 2\vec{DB}, \quad \vec{OA} = 3\mathbf{a}, \quad \vec{OB} = 3\mathbf{b}.$$

(a) Work out in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

(i)  $\vec{OC}$

(a)(i) .....[1]

(ii)  $\vec{AB}$

(ii) .....[1]

(iii)  $\vec{CD}$

(iii) .....[2]

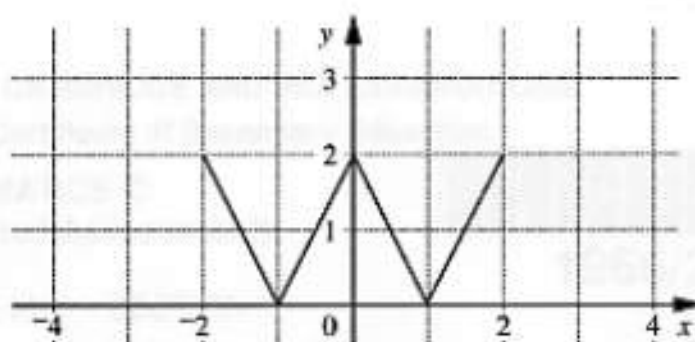
(b) State two facts about the relationship between AB and CD.

.....

.....[2]

6

- 6 This diagram shows the graph of  $y = f(x)$ .



The two graphs below are transformations of  $y = f(x)$ .

Choose the correct equation for each graph.

$$y = f(x + 2)$$

$$y = f\left(\frac{x}{2}\right)$$

$$y = f(x - 2)$$

$$y = \frac{1}{2}f(x)$$

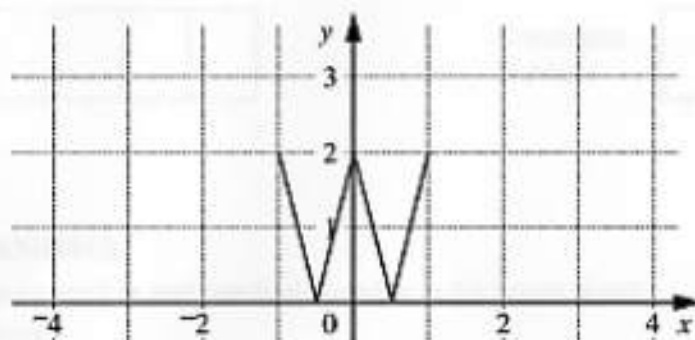
$$y = f(2x)$$

$$y = f(x) - 2$$

$$y = 2f(x)$$

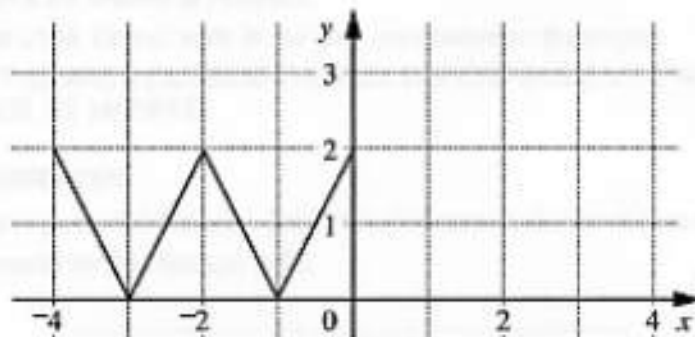
$$y = f(x) + 2$$

(a)



(a) Equation  $y = \dots\dots\dots$  [2]

(b)



(b) Equation  $y = \dots\dots\dots$  [2]