

## Monster Questions – Set 7

### Question 1

Write  $5 - (x + 2) \div \left( \frac{x^2 - 4}{x - 3} \right)$  as a single fraction.

**Simplify your answer fully.**

## Question 2

The diagram shows a cylinder and a sphere.

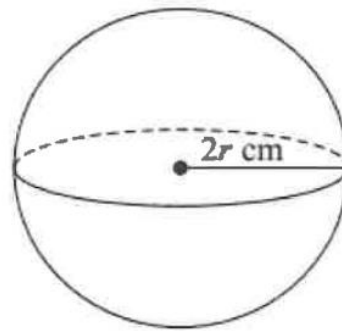
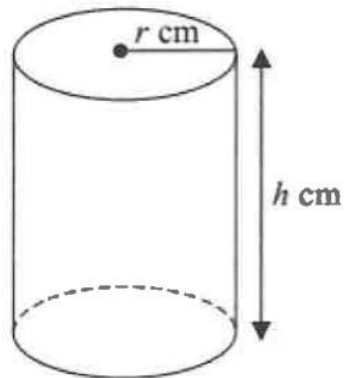


Diagram NOT  
accurately drawn

The cylinder has radius  $r$  cm and height  $h$  cm.  
The sphere has radius  $2r$  cm.

The volume of the cylinder is equal to the volume of the sphere.  
Find an expression for  $h$  in terms of  $r$ .  
Give your answer in its simplest form.

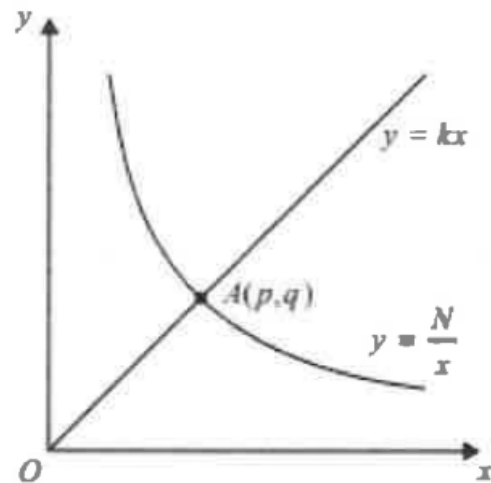
Question 3

(a) Factorise  $4x^2 - 1$

(b) Solve  $\frac{4}{2x+1} + \frac{1}{4x^2-1} = 3$

Show clear algebraic working.

## Question 4



The diagram shows the straight line with equation  $y = kx$  intersecting the curve with equation  $y = \frac{N}{x}$  at the point  $A(p, q)$ .

(a) Find  $p$  and find  $q$ .

Give each answer in its simplest form, in terms of  $k$  and  $N$ .

Given that  $p = 2q$

(b) find the value of  $k$ .

### Question 5

(a) Solve  $x^2 - 4x - 1 = 0$

Show your working clearly.

Give your solutions correct to 3 significant figures.

Hence, or otherwise,

(b) solve  $(x + 3)^2 - 4(x + 3) - 1 = 0$

giving your solutions correct to 3 significant figures.