Mock Grade 7

Maths Booklet 1

Paper 3H
Calculator

www.ggmaths.co.uk

1 The density of ethanol is 1.18 g/cm^3
The density of propylene is 0.84 g/cm^3

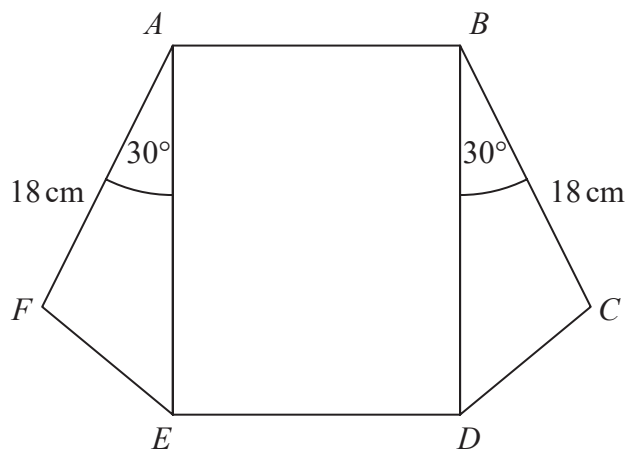90 litres of ethanol are mixed with 252 litres of propylene to make 342 litres of antifreeze.

Work out the density of the antifreeze.
Give your answer correct to 2 decimal places.

.... g/cm^3

(Total for Question 1 is 4 marks)

2 The diagram shows a rectangle, *ABDE*, and two congruent triangles, *AFE* and *BCD*.

area of rectangle *ABDE* = area of triangle *AFE* + area of triangle *BCD*

$$AB : AE = 2 : 3$$

Work out the length of *AE*.

.... cm

(Total for Question 2 is 4 marks)

3 The graph of the curve C with equation $y = f(x)$ is transformed to give the graph of the curve S with equation $y = f(-2x) - 5$

The point on C with coordinates (10, 2) is mapped to the point Q on S.

Find the coordinates of Q.

(........................ , ...)

(Total for Question 3 is 2 marks)

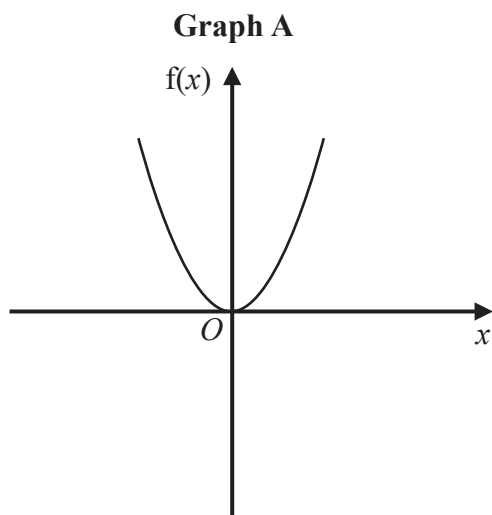**4** Here are the first 5 terms of a quadratic sequence.

-2   -1   1   4   8

Find an expression, in terms of n, for the nth term of this sequence.

....

(Total for Question 4 is 3 marks)

5 Here are four graphs.

Graph A

f(x)

O   x

Graph B

f(x)

O   x

Graph C

f(x)

O   x

Graph D

f(x)

O   x
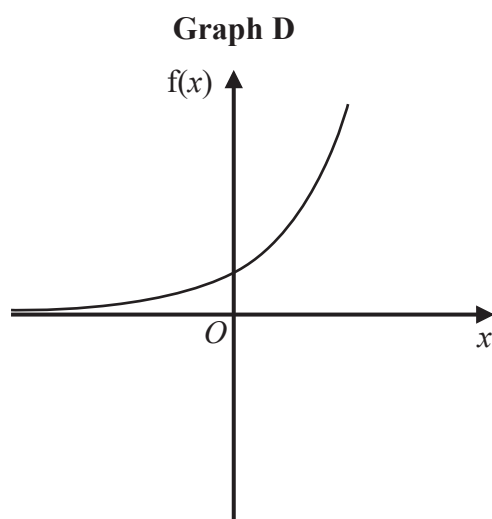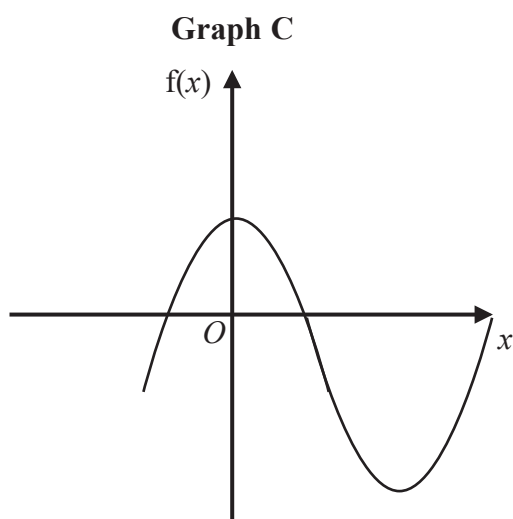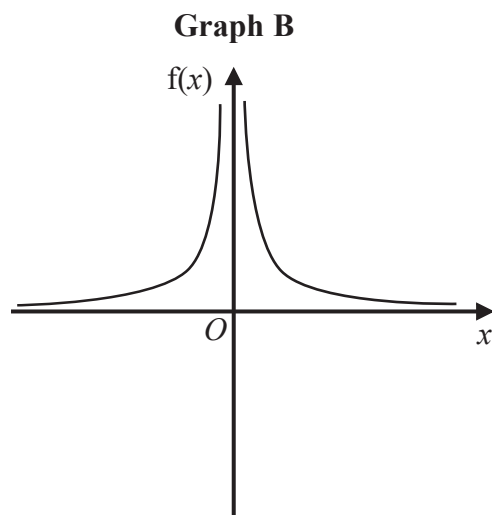
The graphs represent four different types of function f.

Match each description of the function in the table to the letter of its graph.

Description of function	Graph
f(x) is inversely proportional to x^2	
f(x) is directly proportional to x^2	
f(x) is an exponential function	
f(x) is trigonometric function	

(Total for Question 5 is 2 marks)

6 Here are two similar solid shapes.

<center>

A   **B**

</center>

Volume of shape **A** : Volume of shape **B** = 135 : 8

The surface area of shape **B** is $10 \, cm^2$

Work out the surface area of shape **A**.
Give your answer correct to 3 significant figures.

.... cm^3

(Total for Question 6 is 3 marks)

7 There are 16 hockey teams in a league.
Each team played **one** matche against each of the other teams.

Work out the total number of matches played.

....

(Total for Question 7 is 2 marks)

8 The graph shows the speed of a car, in metres per second, during the first 20 seconds of a journey.

Speed (m/s)

Time (s)
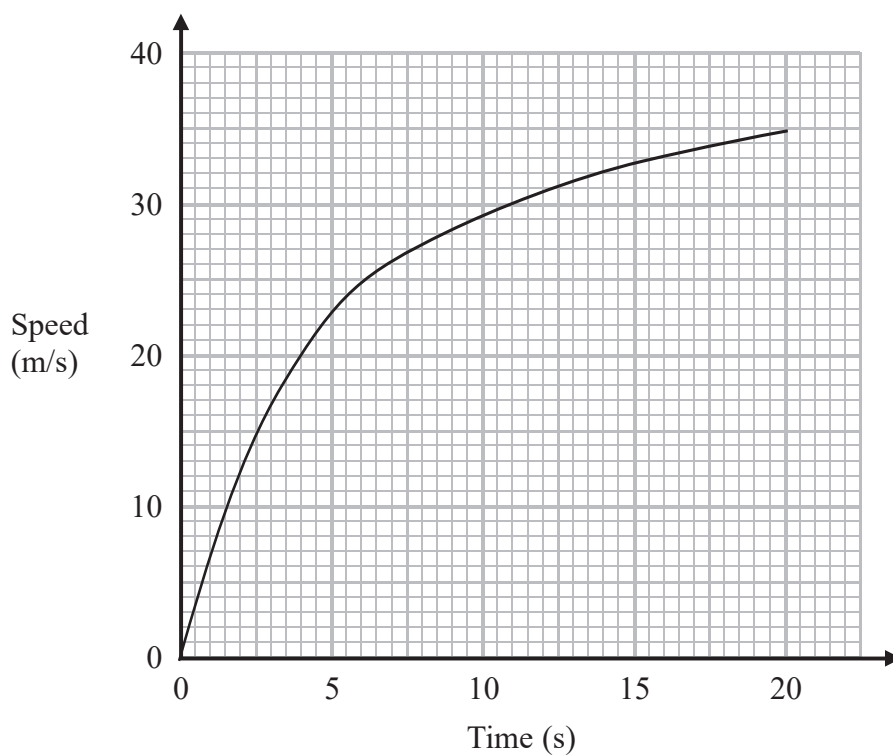
(a) Work out an estimate for the distance the car travelled in the first 20 seconds.
   Use 4 strips of equal width.

.... metres

(3)

(b) Is your answer to part (a) an underestimate or an overestimate of the actual distance
    the car travelled in the first 20 seconds?
    Give a reason for your answer.

....

....

(1)

(Total for Question 8 is 4 marks)