Gold Level

Question Paper 31

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Difficulty Level	Gold
Booklet	Question Paper 31

Time Allowed: **58 minutes**

Score: **/48**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	65%	55%	45%	35%	25%	15%	<15%

1 A metal cube has sides of length 4.5 cm, correct to the nearest 0.5 cm.

The cube is melted down and the metal is used to make small spheres.
Each sphere has a radius of 3 mm, correct to the nearest millimetre.

Work out the greatest number of spheres that could be made from the metal.
Show your working clearly.

.....

(Total for Question 1 is 5 marks)

2 There are 9 counters in a bag.
There is a number on each counter.

Kal takes at random 3 counters from the bag.

He adds together the numbers on the 3 counters to get his Total.

Work out the probability that his Total is 6

.....

(Total for Question 2 is 5 marks)

3 The diagram shows a pentagon.

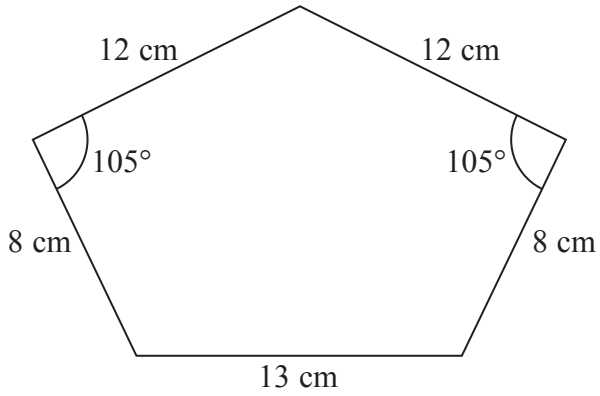


Diagram **NOT** accurately drawn

Work out the area of the pentagon.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 3 is 6 marks)

4 $y = x^3 - \frac{9}{2}x^2 - 54x + 10$

(a) Find $\frac{dy}{dx}$

.....

(2)

The curve with equation $y = x^3 - \frac{9}{2}x^2 - 54x + 10$ has two turning points.

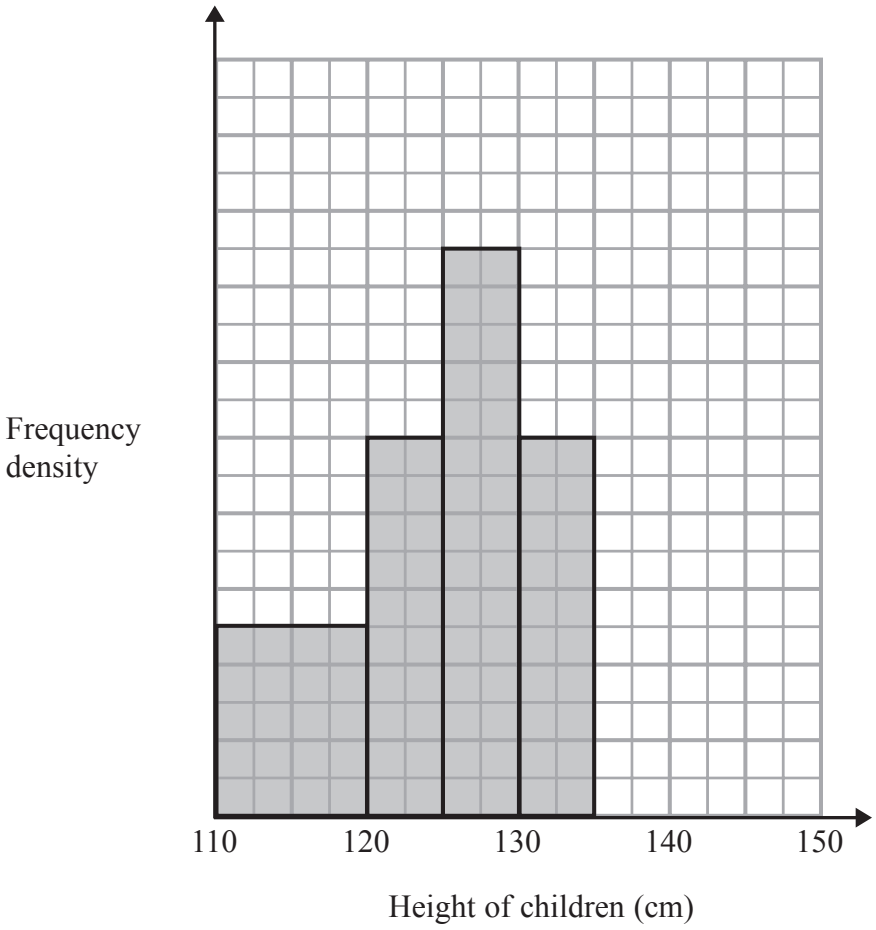
(b) Find the x coordinate of each of these two points.

.....

(3)

(Total for Question 4 is 5 marks)

5 The incomplete histogram shows information about the heights of a group of children.



There were 10 children with heights between 130 cm and 135 cm.

(a) How many children had heights between 110 cm and 130 cm?

.....

(3)

There were 6 children with heights between 135 cm and 145 cm.

(b) Show this information on the histogram.

(1)

(Total for Question 5 is 4 marks)

6

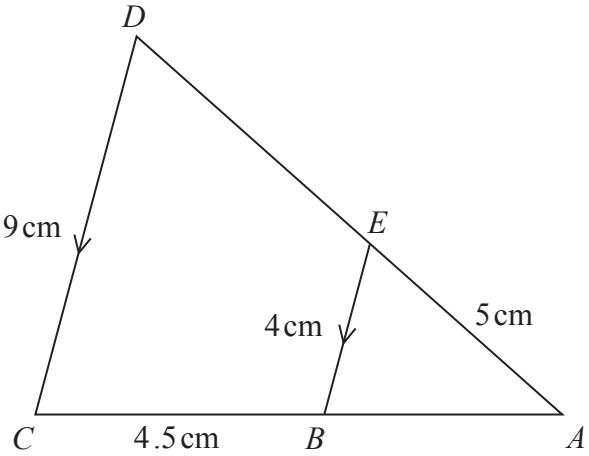


Diagram **NOT** accurately drawn

Triangle ABE is similar to triangle ACD.
AED and ABC are straight lines.
EB and DC are parallel.
$AE = 5$ cm, $BC = 4.5$ cm, $BE = 4$ cm, $CD = 9$ cm

(a) Calculate the length of AD.

..... cm

(2)

(b) Calculate the length of AB.

..... cm

(2)

The area of quadrilateral $BCDE$ is x cm^2
The area of triangle ABE is y cm^2

(c) Find an expression for y in terms of x.
Give your answer as simply as possible.

$y =$ .....

(3)

(Total for Question 6 is 7 marks)

7 f is the function such that

$$f(x) = \frac{x}{3x + 1}$$

(a) Find f(0.5)

.....

(1)

(b) Find ff(–1)

.....

(2)

(c) Find the value of x that cannot be included in any domain of f

.....

(1)

(d) Express the inverse function f^{-1} in the form $f^{-1}(x) = ...$
Show clear algebraic working.

$f^{-1}(x) =$ .....

(3)

(Total for Question 7 is 7 marks)

8

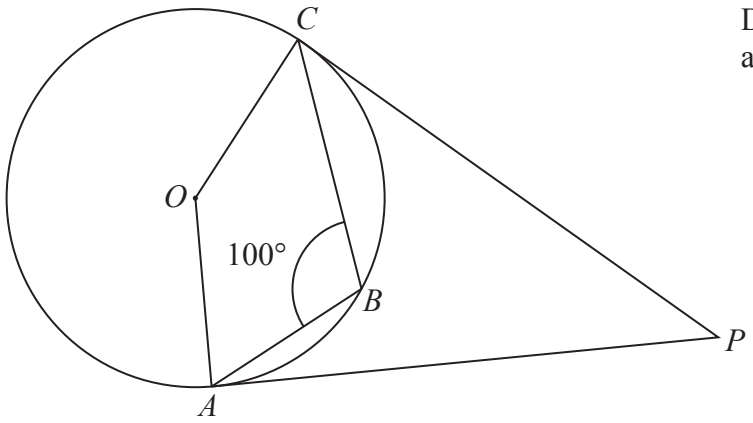


Diagram **NOT** accurately drawn

A, *B* and *C* are points on a circle, centre *O*.
PA and *PC* are tangents to the circle.
Angle *ABC* = 100°

Calculate the size of angle *APC*.

.....°

(Total for Question 8 is 3 marks)

9 (a) Simplify fully $\dfrac{50x^2 - 8}{10x - 4}$

Show clear algebraic working.

.....

(3)

(b) Given that a is a positive integer, show that

$$\sqrt{3a}\left(\sqrt{12a} + a\sqrt{3a}\right)$$

is always a multiple of 3

(3)

(Total for Question 9 is 6 marks)