Forming & Solving Equations

Question Paper

Course	Edexcel IGCSE Maths
Section	2. Equations, Formulae & Identities
Topic	Forming & Solving Equations
Difficulty	Very Hard

Time allowed: 70

Score: /52

Percentage: /100

Question 1

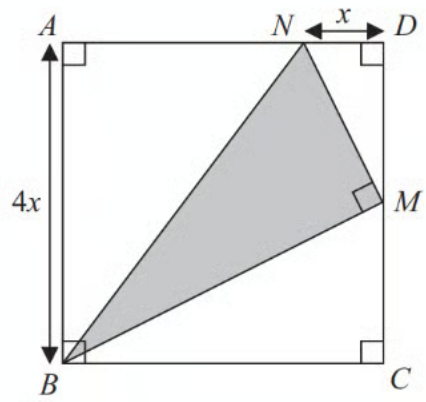


Diagram **NOT** accurately drawn

$ABCD$ is a square with a side length of $4x$
M is the midpoint of DC.
N is the point on AD where $ND = x$

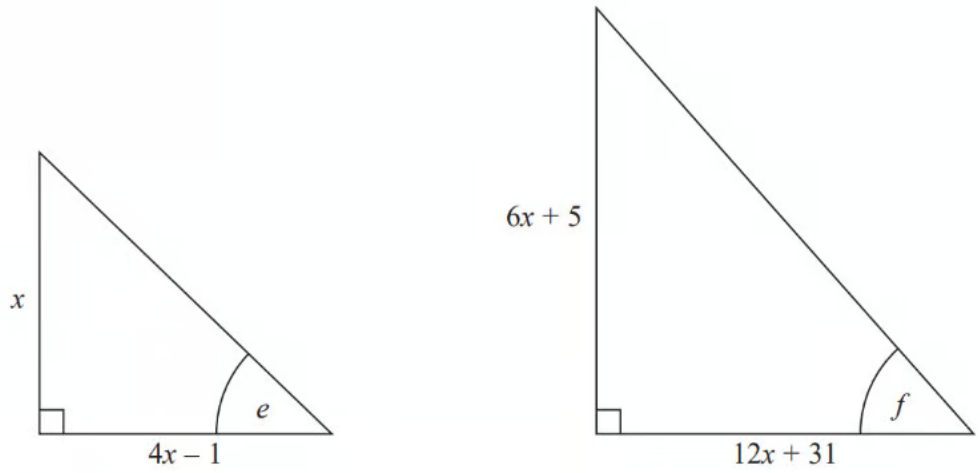
BMN is a right-angled triangle.

Find an expression, in terms of x, for the area of triangle BMN.
Give your expression in its simplest form.

[4 marks]

Question 2

Here are two right-angled triangles.



Given that

$$\tan e = \tan f$$

find the value of x.

You must show all your working.

[5 marks]

Question 3

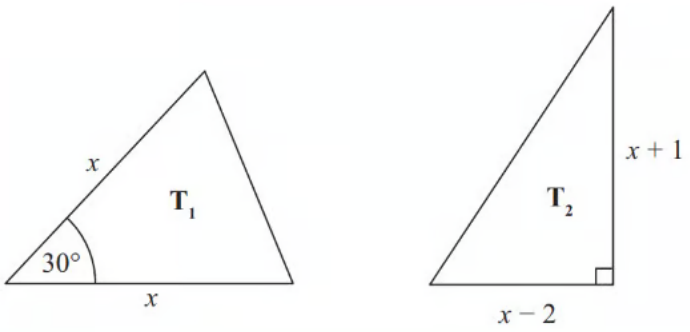


Diagram **NOT** accurately drawn

The lengths of the sides are in centimetres.

The area of triangle $\mathbf{T_1}$ is equal to the area of triangle $\mathbf{T_2}$.

Work out the value of x, giving your answer in the form $a + \sqrt{b}$ where a and b are integers.

[5 marks]

Question 4

There are only r red counters and g green counters in a bag.

A counter is taken at random from the bag.

The probability that the counter is green is $\frac{3}{7}$

The counter is put back in the bag.

2 more red counters and 3 more green counters are put in the bag.
A counter is taken at random from the bag.

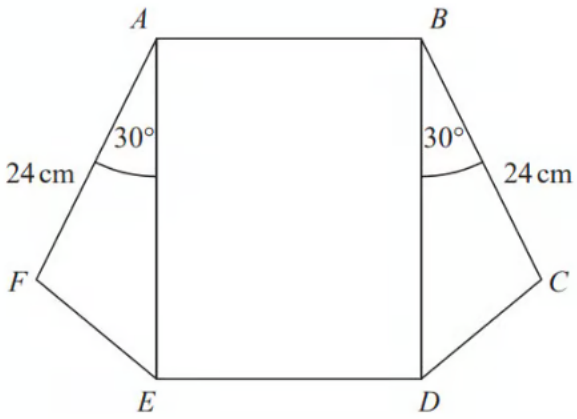
The probability that the counter is green is $\frac{6}{13}$

Find the number of red counters and the number of green counters that were in the bag originally.

[5 marks]

Question 5

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

$$AB : AE = 1 : 3$$

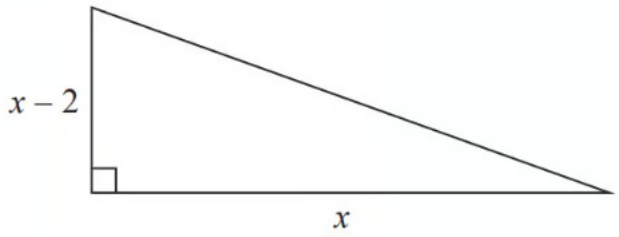
Work out the length of AE.

.....cm

[4 marks]

Question 6

Here is a right-angled triangle.



All measurements are in centimetres.
The area of the triangle is 2.5 cm^2.

Find the perimeter of the triangle.
Give your answer correct to 3 significant figures.
You must show all of your working.

[6 marks]

Question 7

The total surface area of a solid hemisphere is equal to the curved surface area of a cylinder.

The radius of the hemisphere is r cm.
The radius of the cylinder is twice the radius of the hemisphere.

Given that

$$\text{volume of hemisphere} : \text{volume of cylinder} = 1 : m$$

find the value of m.

[4 marks]

Question 8

$ABCED$ is a five-sided shape.

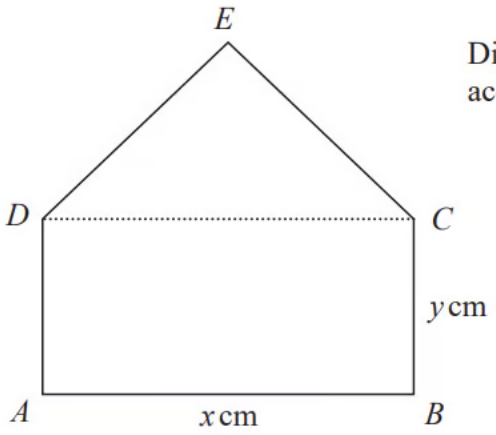


Diagram **NOT** accurately drawn

$ABCD$ is a rectangle.
CED is an equilateral triangle.

$AB = x$ cm $BC = y$ cm

The perimeter of $ABCED$ is 100 cm.
The area of $ABCED$ is R cm^2

Show that $R = \frac{x}{4}\left(200 - \left[6 - \sqrt{3}\right]x\right)$

[3 marks]

Question 9

The diagram shows a sector OBC of a circle with centre O and radius $(6 + x)$ cm.

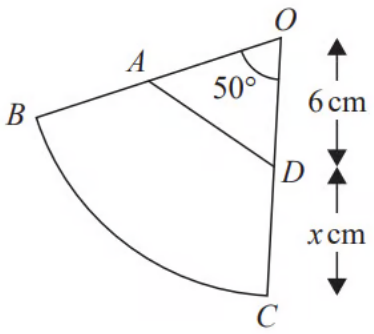


Diagram **NOT** accurately drawn

A is the point on OB and D is the point on OC such that $OA = OD = 6$ cm

Angle $BOC = 50°$

Given that

the perimeter of sector $OBC = 2 \times$ the perimeter of triangle OAD

find the value of x.
Give your answer correct to 3 significant figures.

[6 marks]

Question 10

A bowl contains n pieces of fruit.
Of these, 4 are oranges and the rest are apples.

Two pieces of fruit are going to be taken at random from the bowl.

The probability that the bowl will then contain $(n - 6)$ apples is $\frac{1}{3}$

Work out the value of n
Show your working clearly.

[6 marks]

Question 11

A sphere has radius $2x$ cm

A cone has

radius $3x$ cm
perpendicular height h cm

The sphere and the cone have the same volume.

Work out radius of cone : perpendicular height of cone

Give your answer in the form $a : b$ where a and b are integers.

[4 marks]