NAME: DATE:

SCHOOL:

ST EDWARD'S, OXFORD

Department of Mathematics



14+ Entrance Exam

For Entry in September 2018

Instructions

- 70 Marks
- 1 Hour
- There are 17 questions
- Calculators are allowed
- Write all answers, including your workings, in this booklet.

Q1.

(a) Simplify

(i) $a \times a \times a \times a$,

.....

(ii) $5a \times 6b$,

.....

(iii) $q^8 \div q^2$.

.....

(3)

(b) Solve $5 - 2y = 12$

$y =$ .....

(2)

(c) $v = w^2 - 2w$.

Work out the value of v when $w = 6$

$v =$ .....

(2)

(Total for question = 7 marks)

Q2.

There are 6 batteries in a small packet of batteries.
There are 9 batteries in a large packet of batteries.

Chow buys m small packets of batteries and g large packets of batteries.

The total number of batteries Chow buys is T.

Write down a formula, in terms of m and g, for T.

.....

(Total for question = 3 marks)

Q3.

(a) Factorise fully $18e^3f + 45e^2f^4$

.....

(2)

(b) Solve $x^2 - 4x - 12 = 0$

Show clear algebraic working.

.....

(3)

(Total for question = 5 marks)

Q4.

(a) $A = 2^2 \times 3 \times 5^2$

$B = 2^3 \times 5$

(i) Find the Highest Common Factor (HCF) of A and B.

.....

(ii) Find the Lowest Common Multiple (LCM) of A and B.

.....

(3)

(b) $\dfrac{8^2 \times 8^3}{8^4} = 2^n$

Find the value of n.

$n =$ .....

(2)

(Total for question = 5 marks)

Q5.

(a) Simplify, leaving your answers in index form,

(i) $6^5 \times 6^2 \times 6$

.....

(ii) $(9^7)^2$

.....

(2)

(b) $\frac{5^n \times 5^3}{5^6} = 5^4$

Find the value of n.

n = ...

(2)

(Total for question = 4 marks)

Q6.

1 euro = 120 yen
£1 = 1.2 euros

Change £50 to yen.

..... yen

(Total for question = 2 marks)

Q7. Manu, Liam and Ned share £420 in the rations 4 : 5 : 3
Liam then gives Ned £75

Express the amount of money that Ned now has as a percentage of the £420
Give your answer correct to the nearest whole number.

..... %

(Total for question = 4 marks)

Q8.

Nigel bought 12 boxes of melons.
He paid $15 for each box.
There were 12 melons in each box.

Nigel sold $\frac{3}{4}$ of the melons for $1.60 each.

He sold all the other melons at a reduced price.

He made an overall profit of 15%

Work out how much Nigel sold each reduced price melon for.

$ .....

(Total for question = 5 marks)

Q9.
The mean of four numbers is 2.6
One of the four numbers is 5

Find the mean of the other three numbers.

.....

(Total for Question is 3 marks)

Q10.
Lisa sees a dress in a sale.
The normal price of the dress is $45
The price of the dress is reduced by 12% in the sale.

(a) Work out the price of the dress in the sale.

$ .....

(3)

Lisa's weekly pay increases from $525 to $546

(b) Calculate her percentage pay increase.

..... %

(3)

(Total for question = 6 marks)

Q11.
Three integers have a mean of 7, a median of 5 and a range of 14

Find the three integers.

....

(Total for question = 2 marks)

Q12.

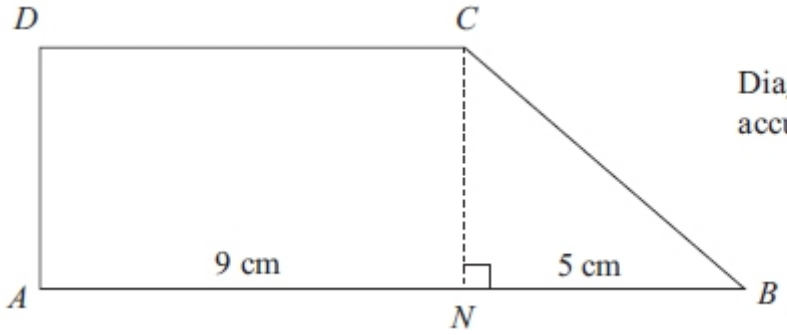


Diagram **NOT** accurately drawn

The shape *ABCD* is made from a rectangle *ANCD* and the right-angled triangle *NBC*.
ANB is a straight line.
AN = 9 cm.
NB = 5 cm.
The area of rectangle *ANCD* is 36 cm^2.
Work out the area of shape *ABCD*.

..... cm^2

(Total for question = 4 marks)

Q13.

Make *t* the subject of $5(t - g) = 2t + 7$

.....

(Total for question = 3 marks)

Q14.

(a) Solve the simultaneous equations

$3x + 5y = 14$

$4x + 3y = 4$

Show clear algebraic working.

x = ...

y = ...

(4)

(b) Write down the coordinates of the point of intersection of the two lines whose equations are $3x + 5y = 14$ and $4x + 3y = 4$

(..... , ...)

(1)

(Total for Question is 5 marks)

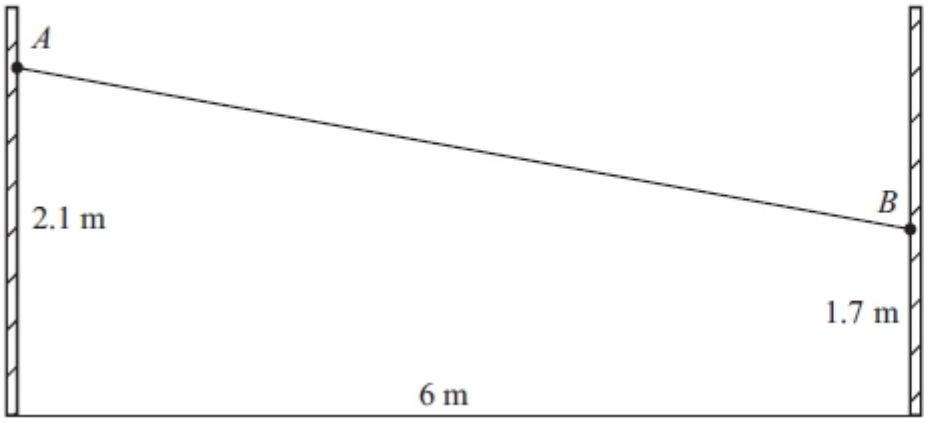
Q15.

A washing line is attached at points A and B on two vertical posts standing on horizontal ground.

Point *A* is 2.1 metres above the ground on one post.

Point B is *1.7* metres above the ground on the other post. The horizontal distance between the two posts is 6 metres.

Diagram **NOT** accurately drawn



Calculate the distance *AB*.

Give your answer correct to 3 significant figures.

..... m

(Total for question = 4 marks)

Q16.

Here is an isosceles triangle.

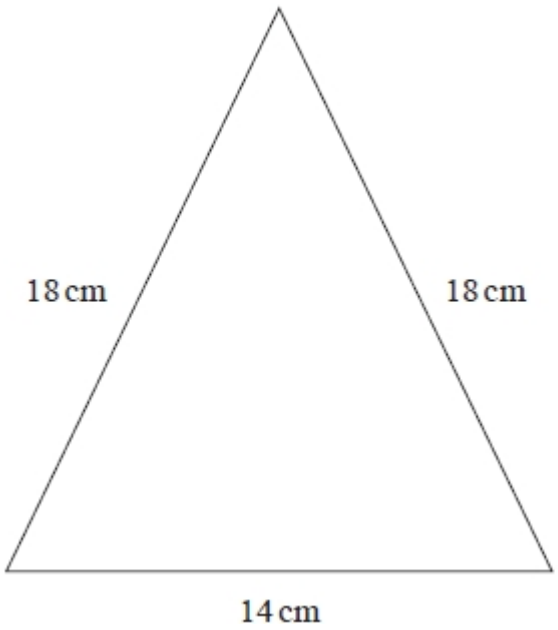


Diagram **NOT** accurately drawn

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

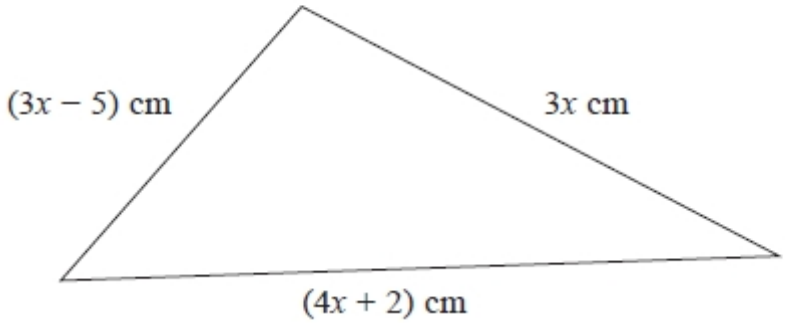
..... cm^2

(Total for question = 4 marks)

Q17.

The diagram shows a triangle.

Diagram **NOT** accurately drawn



The lengths of the sides of the triangle are $3x$ cm, $(3x - 5)$ cm and $(4x + 2)$ cm.

The perimeter of the triangle is 62 cm.

Work out the value of x.
Show clear algebraic working.

x = ...

(Total for question = 4 marks)

END