ST EDWARD'S
OXFORD

13+ SCHOLARSHIP EXAMINATION
2016

MATHEMATICS
PAPER I

1 hour

Answer all questions.

Calculators are NOT permitted.

Name: _____

1. a) You are about to tuck into a chocolate bar when your so-called friend takes $^1/_4$ of it. Another person that you actually like comes along and you give them $^1/_3$ of what you have left. What fraction of the chocolate bar do you have left?

   b) Later, you have another bar of chocolate. You give $^1/_3$ of it away, and then you give $^3/_4$ of what remains to another friend. What fraction of the original bar do you have left?

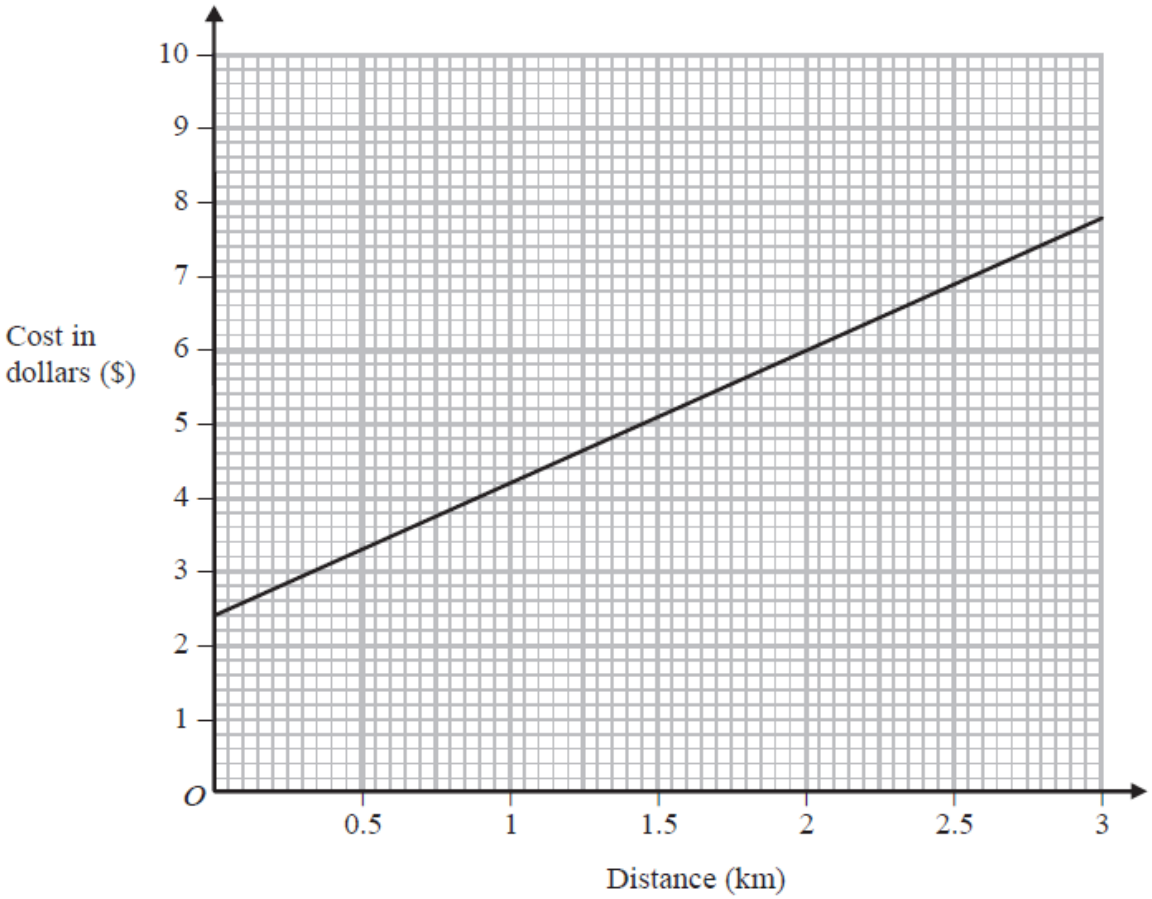
2. The width of a rectangle is increased by one tenth, but the area remains the same. By what fraction has the length of the rectangle been reduced?

3. In a band, the ratio of woodwind players to brass players is 3:4. The ratio of woodwind to brass and strings combined is 2 : 5. What is the ratio of woodwind players to string players?

4. Three people, X, Y and Z, share some money in the ratio 2 : 3 : 5. Z gets £60 more than X. How much money is there in total?

5. If 6% of x is the same as 5% of 120, what is x?

6.



The graph gives information about the costs of Taxi Journeys using Royal Cars for different distances. The cost of a taxi journey consists of a fixed initial charge and a charge per km.

a) From the graph, write down

i) The fixed initial charge

ii) The charge per km

iii) The equation connecting the cost and the distance travelled.

b) Radio Taxis charges a fixed initial charge of $1 but charges twice as much per km as Royal Cars. On the graph draw the line representing the cost of journeys taken with Radio Taxis.

7. ABC is an isosceles triangle.

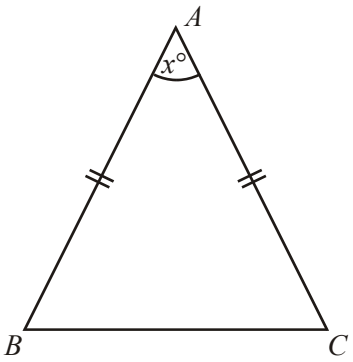


Diagram **NOT** accurately drawn

$AB = AC$
$AB = 3p + q$
$BC = p + q$

(a) Find an expression, in terms of p and q, for the perimeter of the triangle. Give your answer in its simplest form.

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Angle $A = x°$

(b) Find an expression, in terms of x, for the size of angle B.

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(c) Solve the simultaneous equations

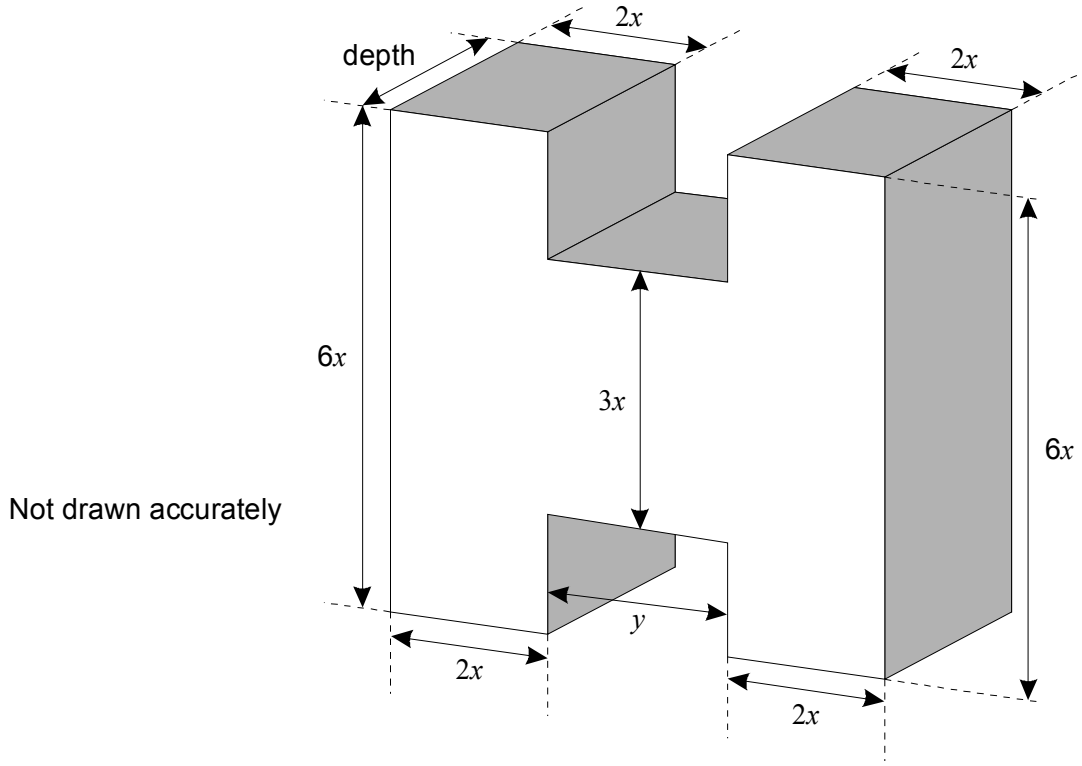
$$3p + q = 11$$

$$p + q = 3$$

$p =$ .....

$q =$ .....

8. This prism was made from three cuboids.



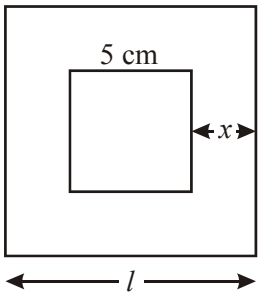
(a) Find the area of the front face in terms of x and y

(b) The volume of the prism is $\mathbf{3x^2\,(8x + y)}$

What is the depth of the prism?

Show your working.

9. A picture is in the shape of a square of side 5 cm. It is surrounded by a wooden frame of width x cm, as shown in the diagram below.



The length of the wooden frame is l cm, and the area of the wooden frame is A cm^2.

(a) Write an expression for the length l in terms of x.

(b) Write an expression for the area A in terms of x.

(c) If the area of the frame is 24 cm^2, find the value of x.