

RADLEY COLLEGE  
13+ ENTRANCE EXAM



**MATHEMATICS**  
SPECIMEN PAPER

Calculators allowed  
Time 1 hour

Name:

1. Each year a church holds a local fete. The money raised is shared between the scouts and the guides in the ratio of 5:3.

(a) In 2006 a total of £872 was raised. How much was given to the scouts?

(b) In 2007 the guides received £252. How much money was raised altogether?

[8]

2. Simplify

(a)  $3p + 4q - 2(p - q)$

(b)  $(2b + 3b)(4a - 5b)$

[7]

3. In a box are six red discs, five blue discs and four green discs. Peter selects a disc at random.

(a) What is the probability that Peter's disc is red?

(b) What is the probability that Peter's disc is not green?

Peter keeps his disc and then Mary selects a disc, at random, from the same box.

(c) What is the probability that Peter and Mary both have blue discs?

(d) What is the probability that Peter and Mary have discs of different colour?

4. A computer is advertised at a price of £1240. John decides to wait for the sales when everything is reduced by 35%.
- (a) How much will John pay for his computer?

In the sales John sees another computer with a sale price of £885.30.

- (b) How much would this computer have cost before the sales?

[7]

5. Solve

(a)  $3x - 4 = 16$

(b)  $5x - 23 = 19 - 9x$

(c)  $\frac{x}{3} = \frac{1}{2}$

[11]

6. Find the mean, median and mode of the shoe sizes of the twenty children whose shoe sizes are given in the table below:

4	2	2	3	5	2	4	1	2	7
2	5	1	4	2	2	6	3	3	3

[7]

7. (a) Solve the simultaneous equations  $y = 2x + 5$  and  $y = 3x - 2$ .

(b) Where do the graphs with equations  $y = 2x + 5$  and  $y = 3x - 2$  intersect?

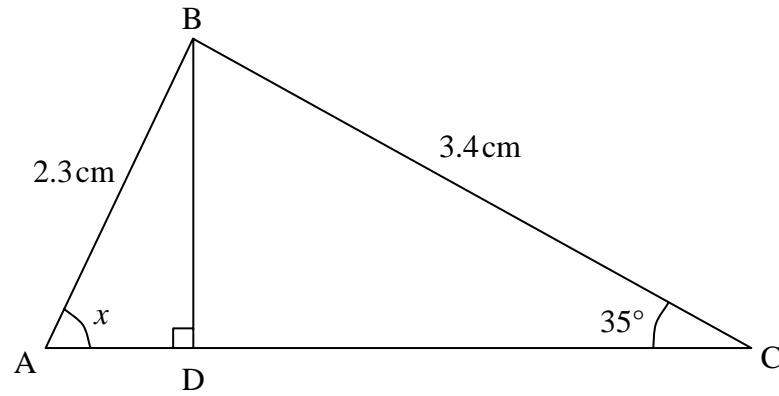
(c) How can you tell that the graphs with equations  $y = 2x + 5$  and  $y = 2x - 2$  do not intersect?

[9]

8. Use your calculator to work out the value of  $\frac{12.37 + 4.98}{5.96 - 2.81}$  giving your answer correct to two decimal places.

[4]

9.



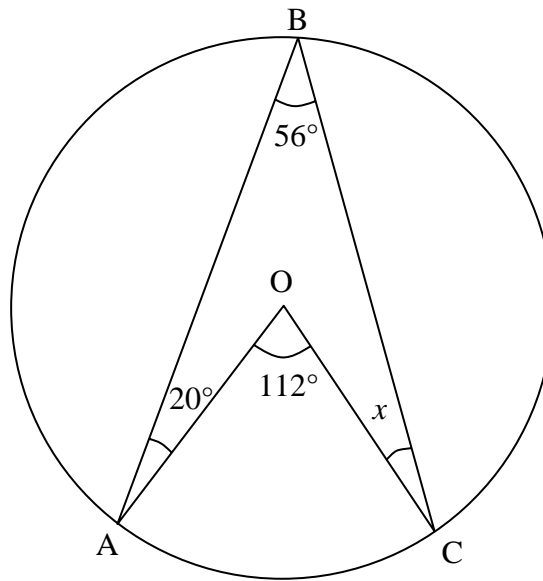
Find the angle  $x$ .

[7]

10. Make  $h$  the subject of the formula  $ah + b = c$

[2]

11. In the diagram below O is the centre of the circle.



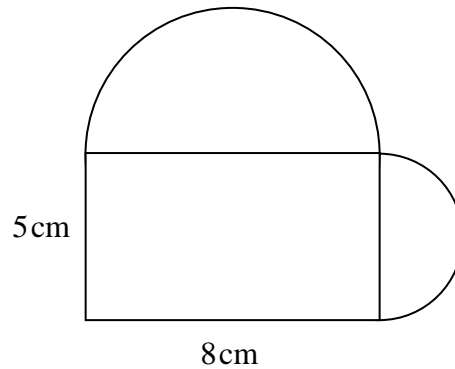
Work out the size of angle  $x$ .

[5]

12. The children in a class sit a Maths test when Richard is ill. The teacher works out the mean mark as 47%. When Richard returns to school he sits the same test, and scores 83%. The teacher tells the children that the mean score for the whole class is now 49%. How many children sat the test altogether?

[6]

13. The diagram shows a badge made by fitting two semicircles on the sides of a rectangle.



Find the area of the badge.

[7]

14. Fred and Bill work in a factory. The normal rate of pay is £ $x$  per hour. The overtime rate is £ $y$  per hour.

Fred does 35 hours at the normal rate, and 4 hours of overtime, and is paid £204.48

- (a) Write down an equation connecting  $x$  and  $y$ .

Bill does 35 hours at the normal rate, and 10 hours of overtime, and is paid £242.40

- (b) Write down a second equation connecting  $x$  and  $y$ .

- (c) Solve these two equations simultaneously to find the values of  $x$  and  $y$ .

[9]