



# Taunton School 13+ Academic Scholarships

Mathematics – sample questions

SAMPLE



Write your answers in the spaces provided  
You must write down all stages in your working

1. The table shows information about the time in each of three cities.  
For each city, it shows the number of hours time difference from the time in London.  
+ shows that the time is ahead of the time in London.  
– shows that the time is behind the time in London.

City	Time difference from London (hours)
Nairobi	+3
New York	–5
San Francisco	–8
Chicago	

- (a) Work out the time difference between
- (i) Nairobi and New York, ..... hours
- (ii) New York and San Francisco. .... hours
- ..... (2)

- (b) The time in Chicago is 1 hour behind the time in New York.  
Complete the table to show the time difference of Chicago from London.
- ..... (1)

- 2.
- (a) Find the mean of the following five numbers  
3, 9, 3, 2, 20  
..... (2)
- (b) Find the median of these numbers  
..... (2)

(c) What would the effect on the median be by replacing the 20 by 10?  
 .....

3. (a) Show that  $\frac{3}{10} + \frac{2}{15} = \frac{13}{30}$  ..... (2)

(b) Find  $2\frac{3}{4} - 1\frac{1}{3}$  ..... (2)

(c) Find  $1\frac{1}{5} \times 2\frac{3}{4}$  ..... (2)

4. Factorise  $3y^2 + 2y$  ..... (2)

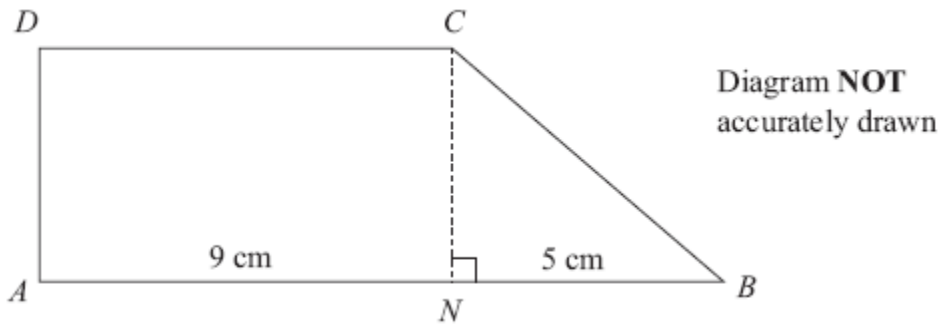
5. Expand and simplify if possible  $9(3x + 2) - 4(2x - 7)$  ..... (2)

6. (a) Write  $\frac{3}{5}$  as a decimal ..... (2)

(b) Write  $\frac{3}{7}$  as a %, accurate to 2 DP  
 ..... % (2)

(c) Sarah gets 23% in a test, the total for the test is 105 marks, what was her mark?  
 ..... % (2)

7.



The shape  $ABCD$  is made from a rectangle  $ANCD$  and the right-angled triangle  $NBC$ .

$ANB$  is a straight line.

$AN = 9$  cm.

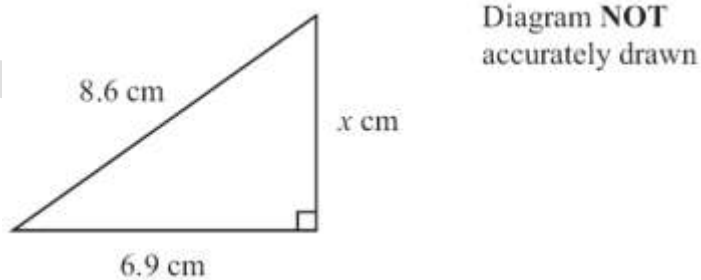
$NB = 5$  cm.

The area of rectangle  $ANCD$  is  $36$  cm<sup>2</sup>

Work out the area of shape  $ABCD$ .

..... cm<sup>2</sup> (3)

8.



Work out the value of  $x$ .

Give your answer correct to 3 significant figures.

$X =$  ..... (3)

9. (a) Solve  $3(2x - 1) = 6$   
Show clear algebraic working

$x = \dots\dots\dots$  (3)

- (b) Solve  $7(y-2) = 3(2y+1)$

Show clear algebraic working

$y = \dots\dots\dots$  (4)

10. The table shows information about the number of peas in each of 25 pods

Number of peas	1	2	3	4	5	6
Number of pods	3	6	5	8	2	1



- (a) Work out the mean number of peas in the 25 pods

$\dots\dots\dots$  (2)

11. The mass of the Space Shuttle is  $7.8 \times 10^4$  kilograms.

(a) Write  $7.8 \times 10^4$  as an ordinary number

..... (1)

The Space Shuttle docks with the International Space Station.

The mass of the International Space Station is  $4.62 \times 10^5$  kilograms

(b) Calculate the total mass of the Space Shuttle and the International Space Station. Give your answer in standard form.

..... (3)

12. (a) The diagram shows a circle inside a rectangle

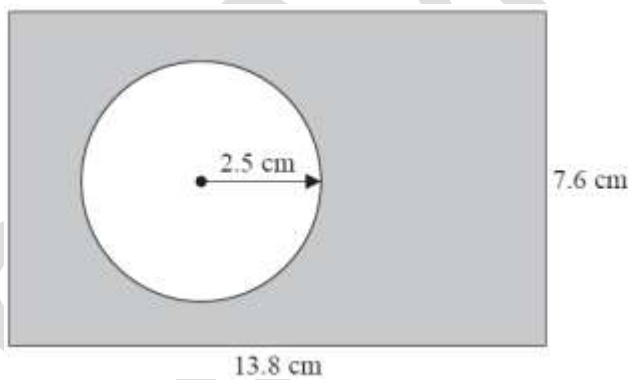


Diagram **NOT**  
accurately drawn

Work out the area of the shaded region, give your answer correct to 3 DP

.....  $\text{cm}^2$  (3)

13. The diagram shows a trapezium

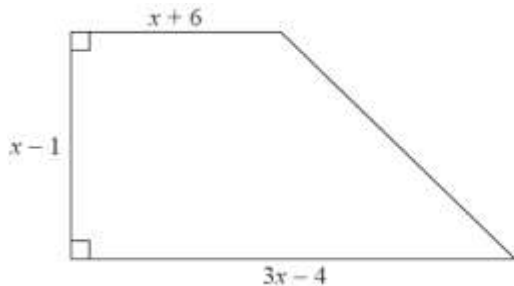


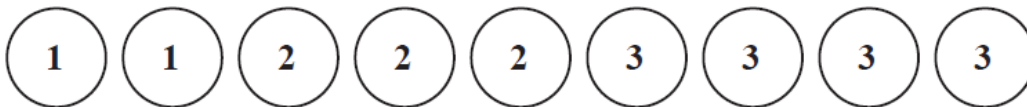
Diagram **NOT**  
accurately drawn

All measurements on the diagram are in centimetres

- (a) If the perimeter is 39 cm find the value of  $x$  and so the length of the shortest side  
Show your working clearly

$X = \dots\dots\dots$   
Shortest side is  $\dots\dots\dots$  (4)

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



Kale takes at random a counter from the bag.

- (a) What is the probability he takes a prime number?

$\dots\dots\dots$  (3)

15. Showing clear algebraic working, solve the simultaneous equations

$$3a + 2b = 1$$

$$a + 2b = 5$$

$a = \dots\dots\dots$  (3)

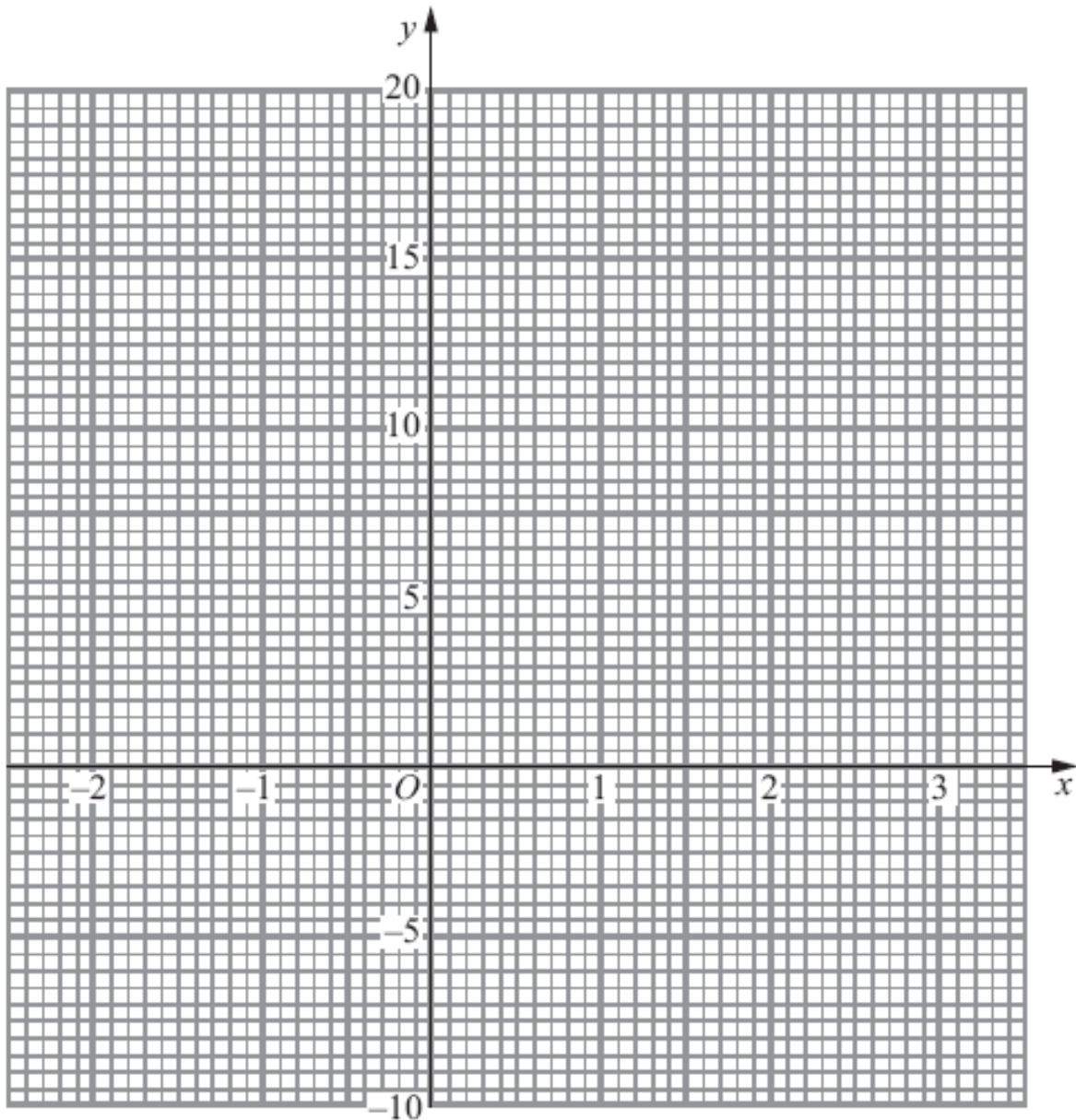
$b = \dots\dots\dots$  (3)

16. (a) Complete the table of values for  $y = x^2 - x - 2$

$x$	-2	-1	0	1	2	3
$y$		1				

..... (2)

(b) On the grid, draw the graph of  $y = x^3 - 3x - 1$  for  $-2 \leq x \leq 3$



..... (2)