BENENDEN

Lower School Scholarship 2019

MATHEMATICS

13+

1 Hour

Full Name: _____

Current school: _____

Date: _____

Equipment required: pen, pencil, ruler, eraser.

Instructions to Candidates:

1 Attempt all questions. Do not worry if you don't manage to do them all.
2 Calculators may NOT be used.
3 Show ALL working.
4 Check your answers for accuracy.
5 Total points for the test: 100

1. Boxes of tins are delivered to a shop.
   There are 375 boxes, each containing 28 tins.
   How many tins are there?

_____

(2)

2. Expand and simplify:

   a) a(4b – a)

_____

(2)

   b) *6(5c – 2d) - (4c - d)*

_____

(2)

   c) *(5 + 3e)(2e + 7)*

_____

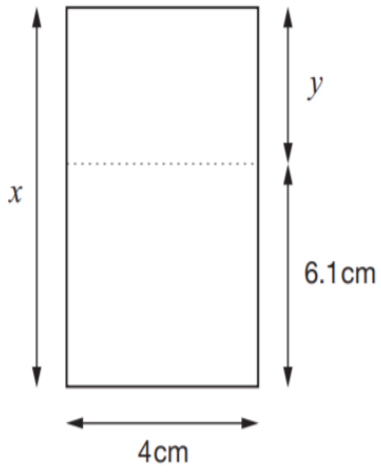
(3)

3. It takes 6 ladies 4 days to crochet a blanket. How long would it take 8 ladies?

_____

(2)

4.



The total area of the rectangle is 44cm^2.

Find lengths x and y.

x = _____

y = _____

(2)

5. At a hospital, the different lunchtime main dishes is shown below, together with the probability that each will be on the menu on any particular day:

Food	Curry	Sausages	Fish	Casserole
Probability	0.36	0.41		0.09

a) What is the probability that fish will be served?

_____ (1)

b) What is the probability that casserole will <u>not</u> be served?

_____ (1)

6. Solve these equations:

a) 18 - 7g = 5g + 21

_____

(3)

b) $\frac{7h + 1}{5} = 3h$

_____

(3)

7. Calculate:

a) $4\frac{5}{8} - 2\frac{3}{5}$

_____

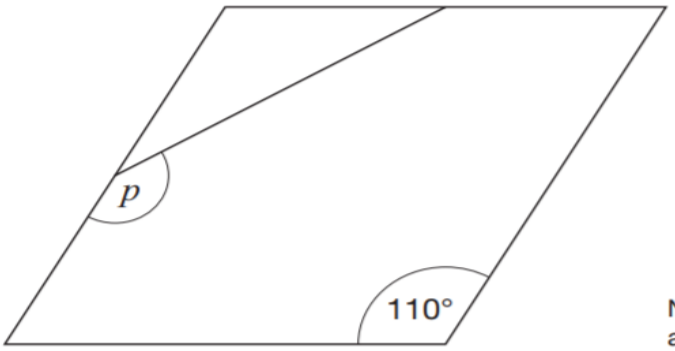
(4)

b) $2\frac{4}{25} \div 2\frac{11}{20}$

_____

(4)

8.



Not drawn accurately

The figure above is a rhombus. The midpoints of two sides are joined as in the diagram. Calculate the size of angle *p.*

_____ (4)

9. Solve the simultaneous equations:

7j - 5k = 26

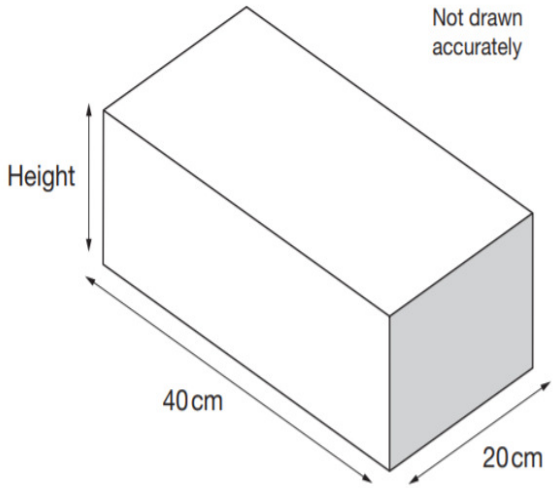
3j + 2k = 7

_____

(5)

10. The cuboid holds 12 litres of water.

1 litre = 1000 cm^3

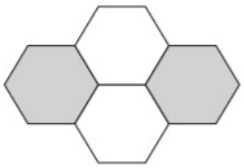


What is the height of the cuboid?

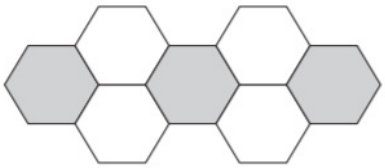
_____

(4)

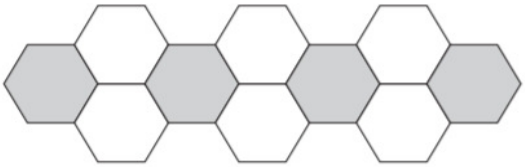
11.



pattern number **1**



pattern number **2**



pattern number **3**

a) What is the number of white hexagons in pattern number *n*?

_____ (2)

b) What is the number of grey hexagons in pattern number *n*?

_____ (2)

c) What is the total number of hexagons in pattern number 20?

_____ (2)

12. a) What is 60% of 120?

_____ (2)

b) Write 72 as a percentage of 90.

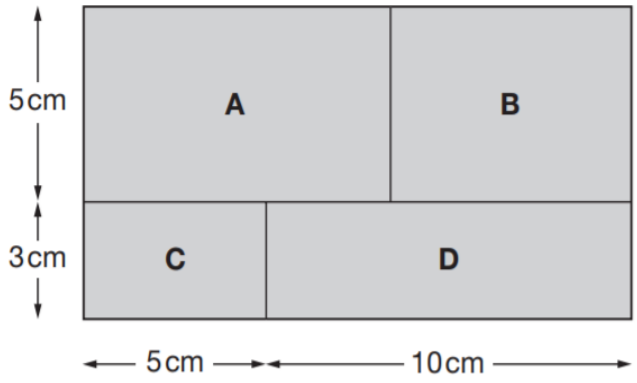
_____ (2)

c) A bike costing £1800 is sold, making a loss of 32%.

What was its selling price?

_____ (3)

13.



Not drawn accurately

In the diagram above,
the ratio of the areas rectangle C : rectangle B is 1 : 2

Calculate the area of rectangle A.

_____ (3)

14. a) Write down a number which is both a square and a cube.

_____ (1)

b) Write down two prime numbers which are factors of 75.

_____ (2)

d) Write down two factors of 600 which add to give a square.

_____ (4)

15. Factorise the following:

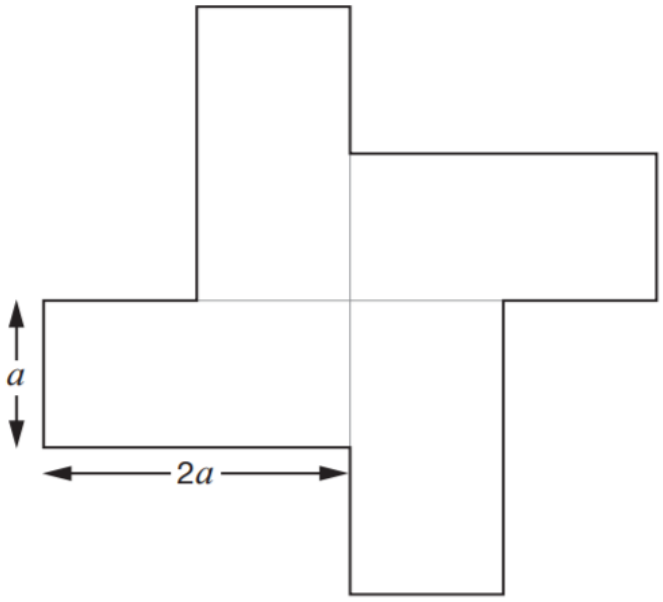
a) $6m^3n^2 + 12m^2n$

_____ (3)

b) $90pq - 15qrs + 45ptq$

_____ (3)

16. The perimeter of the figure below is 40cm.



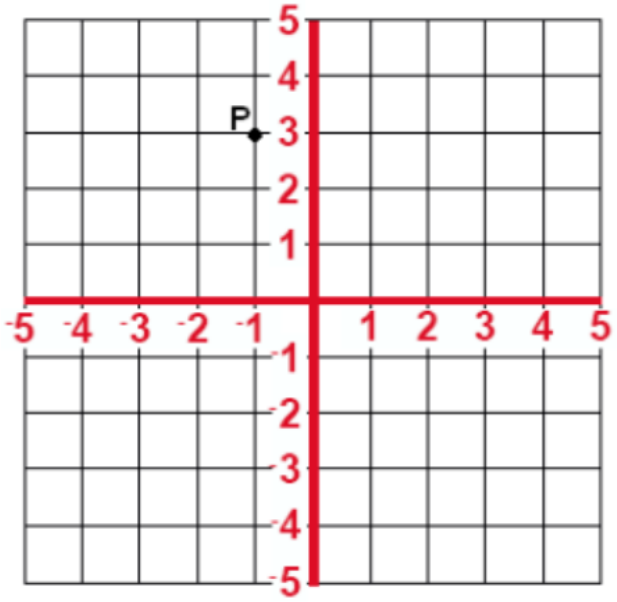
Not drawn accurately

What is its area?

_____ (4)

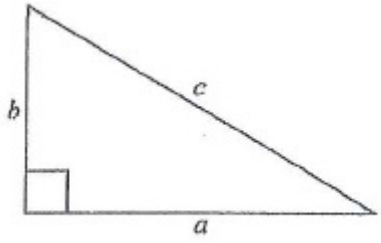
17. Three vertices of a parallelogram are : P(-1, 3), Q(-2, 0) and R(2, 1) .

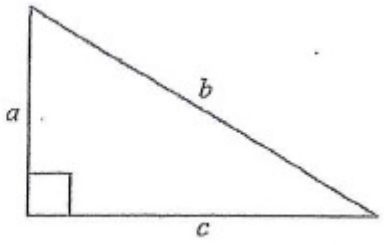
Write down the coordinates of three different points which could be the fourth vertex.



_____ (6)

18. a) For which triangle does $a^2 + b^2 = c^2$? (Tick the correct triangle)



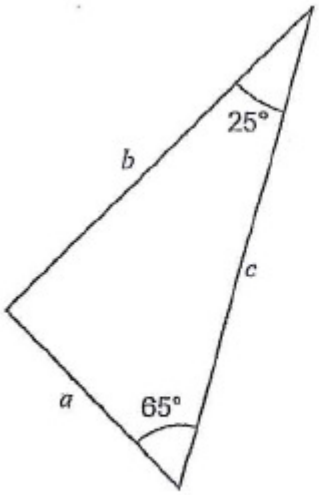


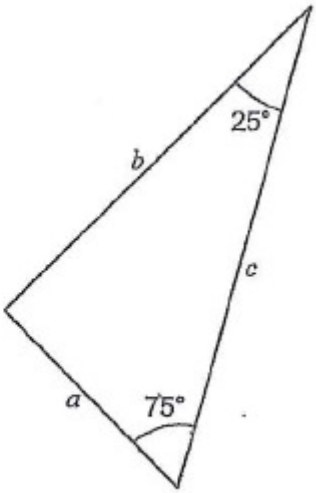
(1)

b) For the <u>other</u> triangle write an equation linking a, b and c.

_____ (1)

c) For which triangle does $a^2 + b^2 = c^2$? (Tick the correct triangle)





(1)

d) Explain your answer, mentioning why the equation does not hold for the other triangle.

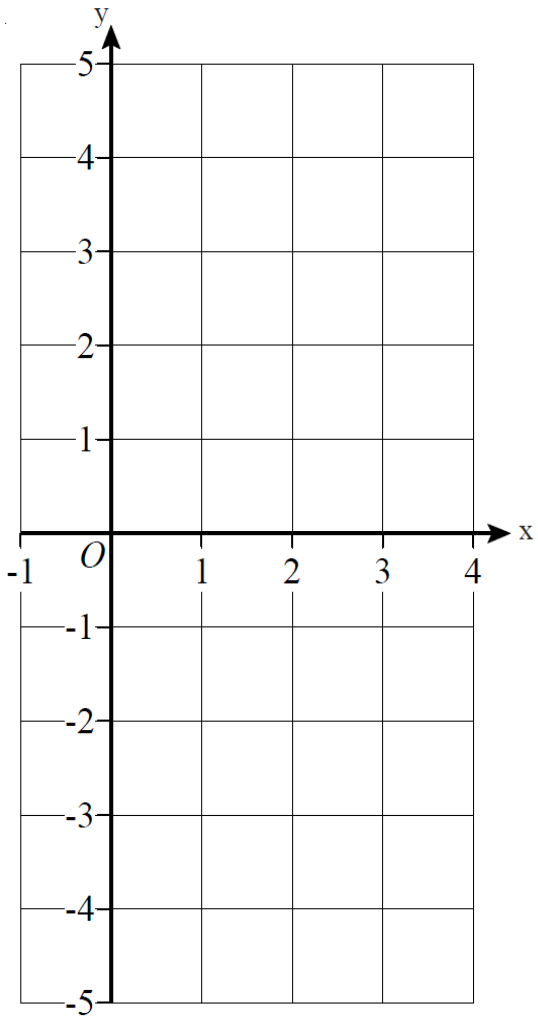
(2)

19. a) Fill in the table of values for $y = 2 - x$

x	-1	0	1	2	3	4
y					-1	

(2)

b) Draw the graph of $y = 2 - x$ on the axes below:



(3)

c) Draw onto the same pair of axes the lines $y = 3$ and $x = -1$.
Label both lines. (3)

20. A water bottle weighs 410g when it is one-quarter full, and 460g when one-third full.

a) What will the bottle weigh when empty?

_____ (3)

b) What will the bottle weigh when half-full?

_____ (3)

END OF TEST

IF YOU HAVE TIME LEFT, TRY THE FOLLOWING:

1. If you wrote down every number between 1 and 1000, how many of the digit 9 would you write down?

2. Snow White wants to weigh Bashful, Dopey and Sleepy. They are unwilling to be weighed on their own but they don't mind being weighed in pairs.

   Bashful and Dopey together weigh 17 stone.
   Dopey and Sleepy together weigh 15 stone.
   Sleepy and Bashful weigh 20 stone.

   What do they each weigh?