HAMPTON COURT HOUSE

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Surname:..... First name:.....

Entrance Examination
Year 9/10

MATHEMATICS

Please read this information before the examination starts.

- This examination is 60 minutes long.
- There are 100 marks in this test.
- Calculators are not allowed.
- Show all your workings clearly. Credit may be awarded for a logical method even if the final answer is incorrect.
- Answer as many questions as you can in the time available. Do not worry if you cannot complete all the questions, as curricula vary from school to school.

1. Write down the answers to these questions.
   You may show your working or work them out in your head.

   a. $124 + 37$

   Answer: ..... [1]

   b. $16 + 4 \times 8$

   Answer: ..... [1]

   c. $1200 - 48$

   Answer: ..... [1]

   d. $39 \div (-3)$

   Answer: ..... [1]

   e. 502×10

   Answer: ..... [1]

   f. Half of 74

   Answer: ..... [1]

   g. 15×0.3

   Answer: ..... [1]

   h. $-263 + 984$

   Answer: ..... [1]

   i. $-705 - 342$

   Answer: ..... [1]

   j. $27 \div 0.9$

   Answer: ..... [1]

   k. $3 + 2 \times 5^2$

   Answer: ..... [1]

   l. $4.5 \times 10 \times (-1)^2$

   Answer: ..... [1]

2. Work out 694 × 27, showing all your workings.

Answer: ..... [2]

3. Here is a start of a number pattern:

28 25 22 19 16 13 10 …… ……

a. From the numbers in the list above, write down
   i. an even number

Answer: ..... [1]

   ii. the product of 2 and 11

Answer: ..... [1]

   iii. a prime number

Answer: ..... [1]

   iv. a square number

Answer: ..... [1]

b. Write down the next two numbers in the pattern.

Answer: .....and..... [2]

c. If you carry on the pattern, which will be the first number below zero?

Answer: ..... [1]

4. Jon keeps chickens and ducks. Altogether he has 168 chickens and ducks. $\frac{2}{7}$ of his animals are ducks.
   a. How many ducks has he got?

Answer: ..... [2]

b. Jon gives away ½ of his chickens. What fractions of his animals does he give away?

Answer: ..... [1]

5. a. Express 132 as a product of its prime factors.

Answer: ..... [2]

b. Express 132 × 6 as a product of its prime factors using indices.

Answer: ..... [1]

6. What is the **smallest number** that has four different prime factors?

Answer: ..... [2]

7. Simplify the following: $3x + 7y - 6x + 23y$

Answer: ..... [2]

8. Solve these equations to find x:
   a. $x - 5 = 17$

Answer: ..... [1]

b. $\frac{x}{2} + 3 = 12$

Answer: ..... [2]

9. Substitute $a = 2$, $b = -1$ and $c = 5$ and evaluate:

a. $3a + b$

Answer: ..... [1]

b. $a + 4c - 3b$

Answer: ..... [2]

c. $4ac - 3b^2$

Answer: ..... [2]

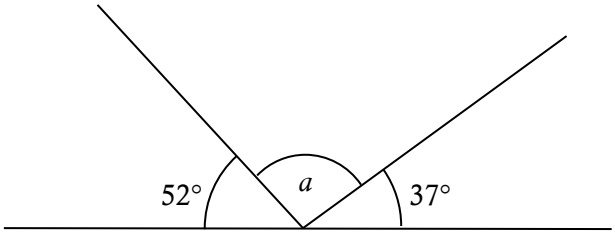
10. Expand $p(2q + r)$

Answer: ..... [2]

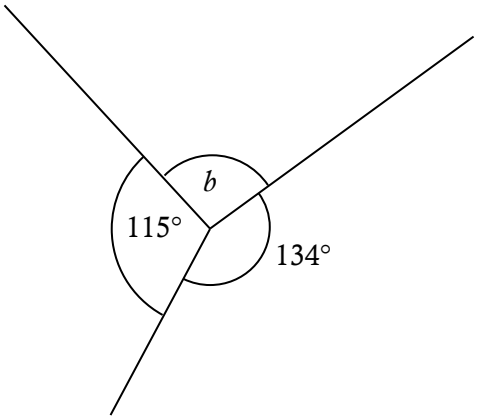
11. Expand, and simplify if possible, $(x - 3)(2x - 4)$

Answer: ..... [3]

12. Calculate the missing angles.



Answer: ..... [2]



Answer: ..... [2]

13. Divide £121 in the ratio 4:7.

Answer: ..... and ..... [2]

14. If a coin and a die are tossed together, what is the probability of getting a head on the coin and a number less than three?

Answer: ..... [2]

15. There are two Maths classes in Year 6, one is called 6A and the other 6B.
The numbers of boys and girls in each class is shown in the table.

	boys	girls	total
6A	14		
6B		6	18
total			48

a. Complete the table. [2]

b. What fraction of the girls are in 6A?

Answer: ..... [1]

c. A pupil is chosen at random. What is the probability of picking someone from class 6B?

Answer: ..... [1]

d. A student is chosen from class 6B. What is the probability of picking a girl?

Answer: ..... [1]

e. Some girls join Year 6 from another school. Half of Year 6 are now boys. How many girls have joined the school?

Answer: ..... [1]

16. Write the following as top heavy fractions:

a. $3\frac{3}{5}$

Answer: ..... [1]

b. $2\frac{1}{3}$

Answer: ..... [1]

17. Solve the following, leaving your answers in the simplest form.

a. $\frac{1}{4}+\frac{3}{8}$

Answer: ..... [2]

b. $\frac{3}{7}-\frac{3}{4}$

Answer: ..... [2]

18. Solve the following, leaving your answers in the simplest form.

a. $\frac{1}{6} \times \frac{3}{4}$

Answer: ..... [2]

b. $\frac{5}{8} \div \frac{3}{4}$

Answer: ..... [2]

19. Jon looks at the Year 7 test results in Maths and lists the marks:

20, 5, 11, 12, 0, 1, 5, 2, 15, 14, 3, 5, 14, 4

a. What is the range?

Answer: ..... [1]

b. What is the median score?

Answer: ..... [2]

c. What is the mean score?

Answer: ..... [2]

d. What is the mode?

Answer: ..... [1]

e. Jon realises that the student with a score of 0, did in fact answer one question correctly and therefore got 1 mark.
Explain why this affects the mean score but not the median.

Answer: .....

.....

..... [2]

20. My cat drinks two thirds of a bottle of milk a day. How long will 6 bottles last?

Answer: ..... [2]

21. A lottery "jackpot" pay-out of €1 275 363 was shared amongst three people.
    a. How much did each receive?

Answer: € ..... [2]

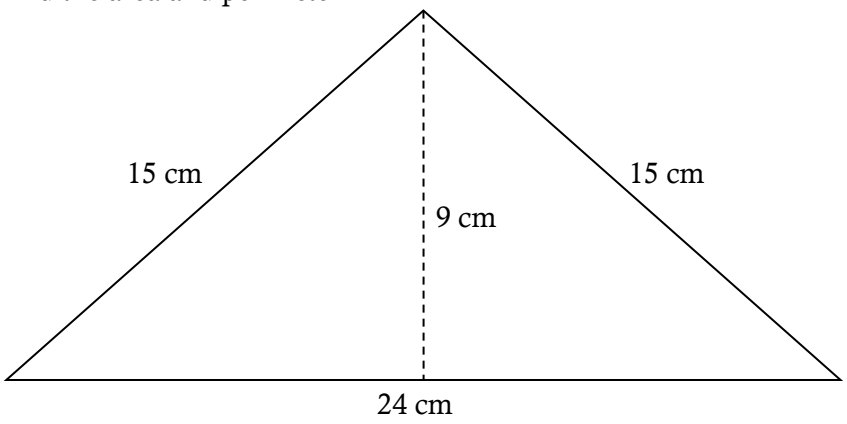
    b. How much did each receive, to the nearest thousand Euros?

Answer: € ..... [1]

    c. Round your answer to part a to 2 significant figures.

Answer: € ..... [1]

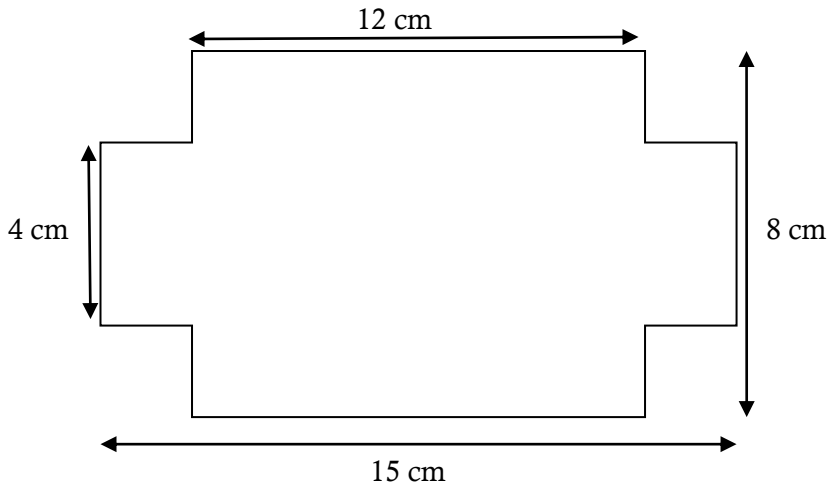
22. Find the area and perimeter



Perimeter: ..... cm [1]

Area: ..... cm^2 [2]

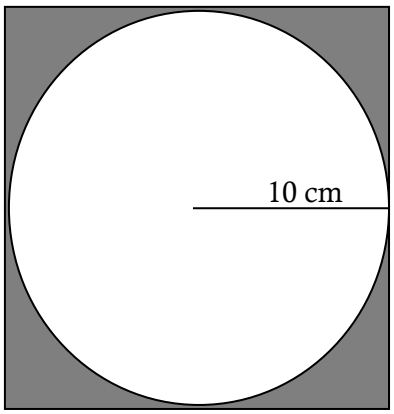
23. Find the area and perimeter



Perimeter: ..... cm [2]

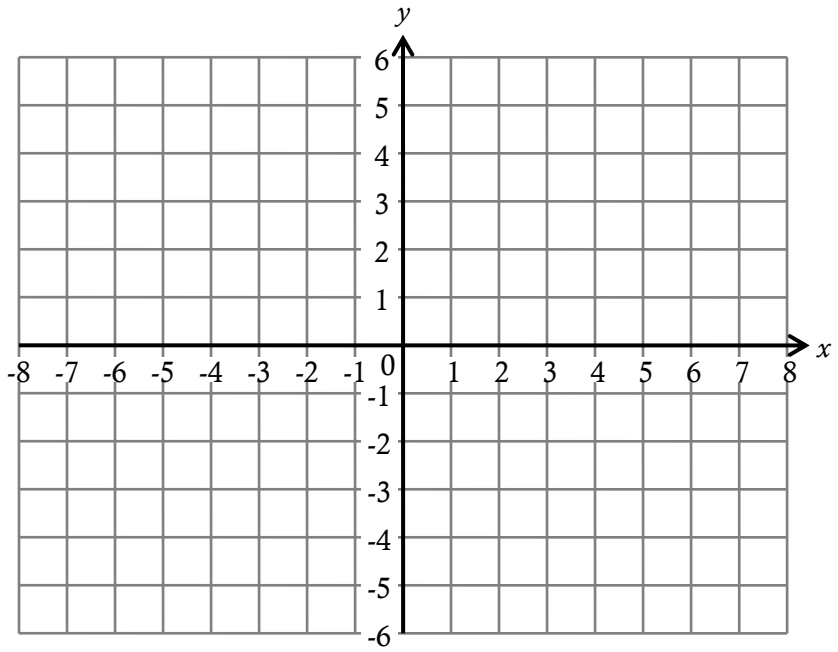
Area: ..... cm^2 [2]

24. The formula for the area of a circle is $A = \pi r^2$. For the following task use $\pi = 3.14$.
A circle of radius 10 cm is inscribed inside a square as shown. Find the area of the shaded region.



Area: ..... cm^2 [2]

25. Plot and label the graphs $y = 2x + 2$ and $y = -3x - 1$ on the axes below.



[4]

26. Line L has equation $y = \frac{1}{2}x + 2$

Write down an equation which is:

a. parallel

Answer: ..... [1]

b. perpendicular

Answer: ..... [1]

c. parallel and passes through (4, 5)

Answer: ..... [2]

END OF EXAMINATION