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THE PERSE

UPPER SCHOOL

CAMBRIDGE

Year 9 Entrance Exams

Maths

Specimen Paper 3

Instructions to candidates

Time allowed: 1 hour

1. Show all working - you may receive marks for correct working even if your final answer is wrong.

2. Answer as many questions as you can, in any order. You are not expected to finish the paper.

3. Do not spend too long on any one question - if you get stuck, move on to the next.

4. Answer and working should be written on the exam paper in the spaces provided.

5. Calculating aids are **NOT** permitted.

1. Solve $17 - \chi = 1 + 3\chi$

Answer: $\chi =$ _____

2. Brian was reading a novel. He said, “If I take the sum of the number of the page I’m on with the number of the page on its right, I get 425.” Which page is Brian on?

Answer: _____

3. Calculate

(a) $62.73 + 5.1$

Answer: (a) _____

(b) 7.21×8.3

Answer: (b) _____

(c) $0.1 - (0.1)^2$

Answer: (c) _____

(d) $1\frac{1}{2} + \frac{2}{3} \times 1\frac{1}{5}$

Answer: (d) _____

4. Write $\frac{2}{11}$ as a recurring decimal.

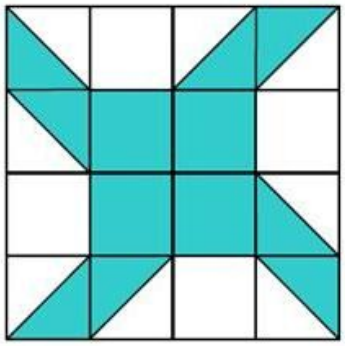
Answer: _____

5. A large protozoa is one tenth of a millimetre across.

   Write down this length in metres.

Answer: _____metres

6. The diagram shows squares, each of side 1cm. Calculate the area shaded.



Answer: Area = _____cm^2

7. What is 5 divided by $\frac{1}{3}$

Answer: _____

8. You are given 3721 x 586 = 2180506

   What is the value of 2180506 ÷ 37.21?

Answer: _____

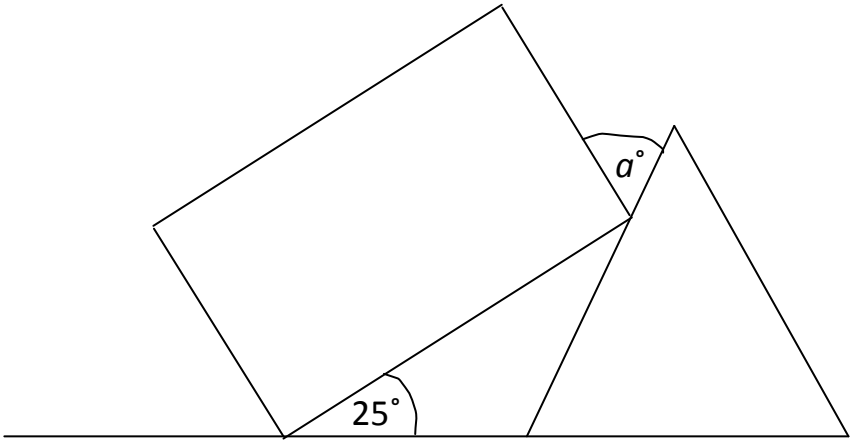
9. What is the value of 2004^2?

(A) 4016 **(B)** 41616 **(C)** 400016 **(D)** 4000016 **(E)** 4016016

Answer: _____

10. The diagram below shows a rectangle that just touches and equilateral triangle.

Diagram not drawn to scale



Work out the size of the angle marked *a*

Answer: *a* = _____

11. Simplify as much as possible, each of the following:

(i) $2\chi^2 - \chi - 1 - \chi^2 - 5\chi - 3$

Answer: (i) _____

(ii) $\frac{20x^6}{5x^4}$

Answer: (ii) _____

12. $a = \frac{7}{15}$ On my calculator, a is shown as 0.4666666667

(i) Write a to 3 significant figures

Answer: (i) _____

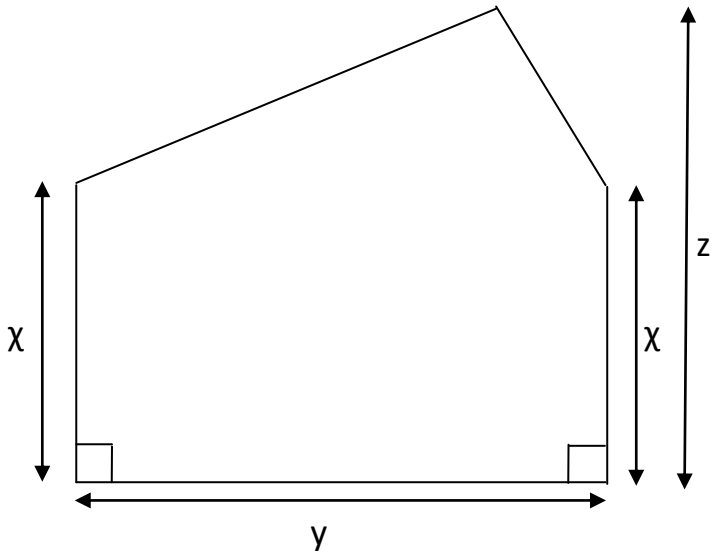
(ii) Write $10a$ to 3 decimal places

Answer: (ii) _____

(iii) Write a to 12 decimal places

Answer: (iii) _____

13. What is the area of the figure shown?



A. ½χ(z - y) **B.** ½χ(z + y) **C.** ½z(χ + y) **D.** ½y(χ + z) **E.** ½y(z - χ)

Answer: _____

14. Factorise fully:

(i) 12χ - 24

Answer: (i) _____

(ii) $2\pi r^2 + 2\pi rh$

Answer: (ii) _____

15. Write in standard form:

(i) 20700000

Answer: (i) _____

(ii) 0.0000000000605

Answer: (ii) _____

16. After training, Simon increased his average speed in the 'Sawston Fun Run' by 25%. By what percentage did his time decrease?

(A) 50 **(B)** 30 **(C)** 25 **(D)** 20 **(E)** 10

Answer: _____

17. A tool-hire company has a fixed charge of £9 plus £8 per day to hire a tool. If I hire a ladder for *n* days, write down a formula (£*C*) for the total hire cost.

Answer: *C* = _____

A different company represents its charges on the graph shown below. Use the graph to work out the fixed charge and the daily rate.



Answer: fixed charge = £_____

Answer: daily rate = £_____

18. The mean of five numbers 5, χ, 9, 10 and 20 is 10. Find the value of χ.

Answer: _____

19. $a = 5$, $b = 6$ and $c = -2$

Find the value of each of the following:

(i) $3a - 2c$

Answer: (i) _____

(ii) $\dfrac{2a - b}{a - b}$

Answer: (ii) _____

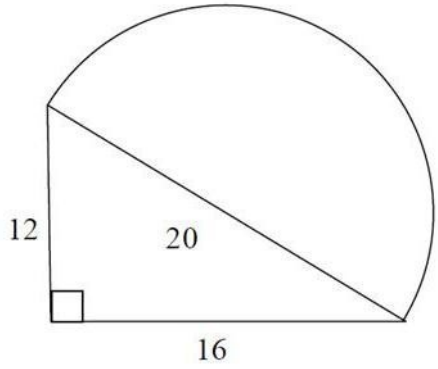
(iii) $2b^2$

Answer: (iii) _____

(iv) $(b - 2c)^2$

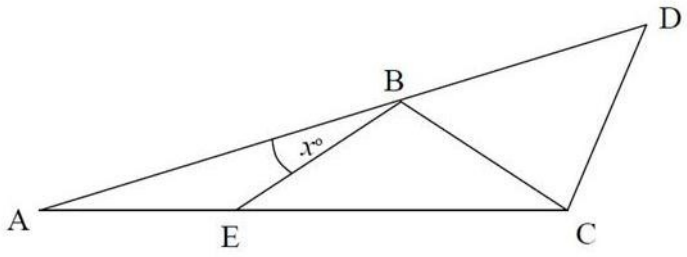
Answer: (iv) _____

20. The diagram shows a triangle and a semicircle. Calculate its area. (Take $\pi = 3.14$)



Answer: Area = _____

21.



The figure **(not drawn to scale)** is such that ABD is a straight line and

AE = EB = BC = CD

If $\angle$ ABE = χ, find (in terms of χ)

(i) $\angle$ BEC

Answer: (i) _____

(ii) $\angle$ DBC

Answer: (ii) _____

(iii) $\angle$ BCD

Answer: (iii) _____

If $\angle$ ACD = 120˚, calculate χ.

Answer: χ = _____

22. Calculate 7.59 ÷ 5.06

Answer: _____

23. I have some rabbits and some rabbit hutches. When I put seven rabbits in each rabbit hutch, one rabbit is left over. If I put nine rabbits in each rabbit hutch, one hutch is left over. How many rabbits and how many rabbit hutches are there?

[You must show your method to gain full marks for this problem]





Answer: Number of rabbits = _____

Answer: Number of hutches = _____

24. Suppose that a, b, c and d are different positive whole numbers, with $c + b + c + a = 9$, $d + a + c = 10$ and $b = 1$

What is d?

Answer: d = _____

Now check through your work carefully!