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THE PERSE

UPPER SCHOOL

CAMBRIDGE

Year 9 Entrance Exams

Maths

Specimen Paper 4

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. Fill in the missing digits to complete the following multiplication:

2005 = | 5 | x | | | |

2. Calculate as a fraction, each of the following:

(a) $\frac{2}{3} + \frac{8}{15}$

Answer: (a) _____

(b) $1\frac{2}{7} \div 1\frac{1}{4}$

Answer: (b) _____

(c) $\sqrt{\frac{4}{5} \times 1\frac{4}{5}}$

Answer: (c) _____

3. Four of these points lie on the straight line with equation y = 2x - 5.

Which is the odd one out?

A (3 , 1) **B** (5 , 5) **C** (-2 , -8) **D** (-1 , -7) **E** (6 , 7)

Answer: _____

4. At a certain school, students are given a points score calculated from their grades.

Simon has 4 A grades and 4 B grades and has a score of 36.

Peter has 2 A grades and 4 B grades and has a score of 26 points.

What would be the points score of someone with 3 A grades and 2 B grades?

Answer: _____

5. Simplify as much as possible:

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

Answer: (a) _____

(b) $\frac{4x^3y^2}{6yx}$

Answer: (b) _____

6. Four of these numbers can make two pairs so that each pair adds up to 78561. Which number is the odd one out?

A 40072 **B** 36712 **C** 29769 **D** 38489 **E** 48792

Answer: _____

7. Factorise:

$ab - a^2$

Answer: _____

8. Calculate

(a) 72.5 - 49.72

Answer: (a) _____

(b) 8.4 x 9.6

Answer: (b) _____

(c) $0.2 - (0.2)^2$

Answer: (c) _____

(d) 100 - 10 x 7.31

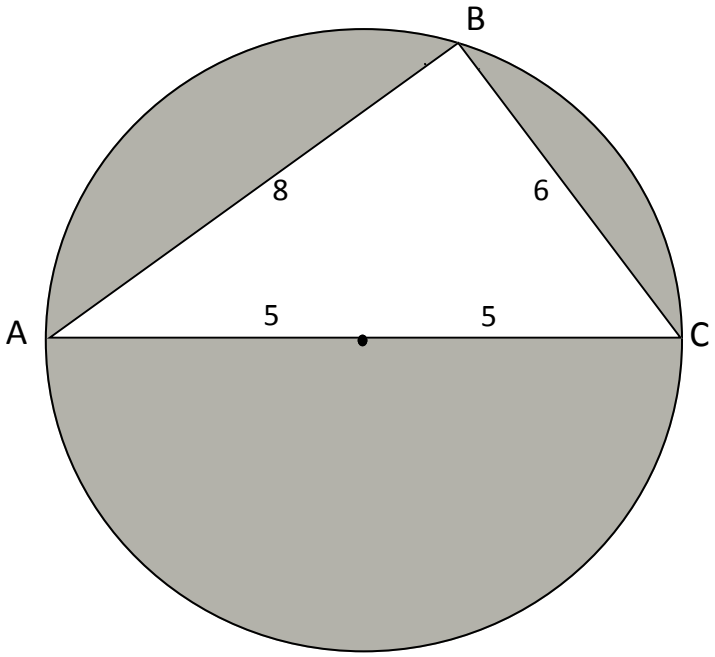
Answer: (d) _____

9. What is the mean (average) of

$\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and $\frac{5}{6}$

Answer: _____

10.



The diagram shows a right angled triangle ABC and a circle. A, B and C are points on the circumference of the circle and AC is a diameter.

AB = 8cm, BC=6cm and the radius of the circle is 5cm.

(a) Calculate the area of the triangle ABC

Answer: (a) _____cm^2

(b) Calculate the area of the shaded part of the circle (take $\pi = 3.14$)

Answer: (b) _____cm^2

11. $\chi = -2$, $y = 3$ and $z = 5$

    Find the value of each of the following:

    (i) $\chi - 2y$

    Answer: (i) _____

    (ii) $3z^2$

    Answer: (ii) _____

    (iii) $\frac{y - \chi}{z}$

    Answer: (iii) _____

12. Stuart leaves his home at 0700 hourse. He drives 84 miles to work. He drives at an average of 36 miles per hour. At what time does Stuart arrive at work?

    Answer: _____

13. Simplify as much as possible:

    $2x + 5x^2 - 3 - (x^2 + 5x - 2)$

    Answer: _____

14. The ages of two friends are in the ratio 3 : 4. In 8 years time their ages will be in the ratio 5 : 6. How old are they now?

A 3 and 4 **B** 6 and 8 **C** 9 and 12 **D** 12 and 16

Answer: _____

15. (a) Write the number 7604 in standard (scientific) form

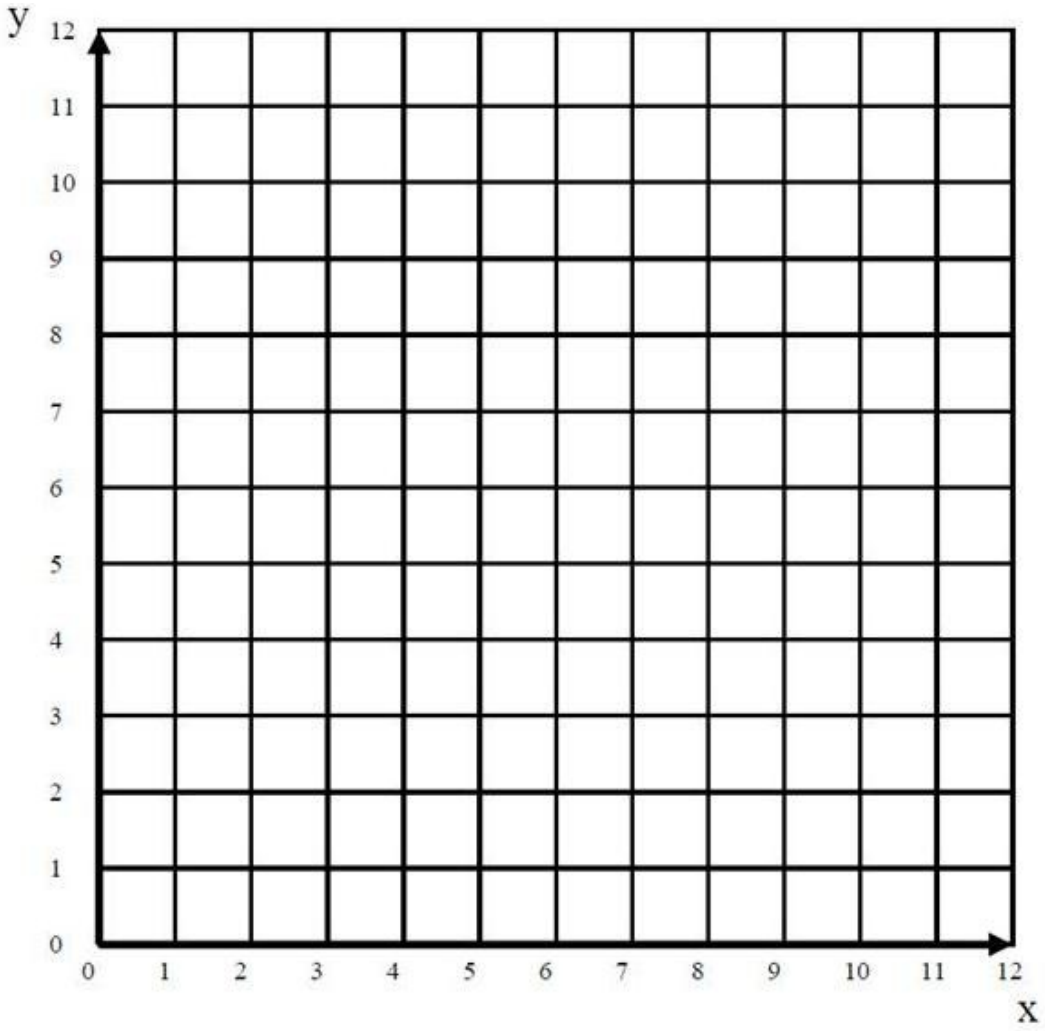
Answer: (a) _____

(b) Write the number 1.27×10^{-2} in decimal form

Answer: (b) _____

16. On the grid, plot the points (1 , 2), (1 , 5) and (3 , 5).

Join the points to form a triangle. Shade the triangle and label it A.



(i) Reflect the triangle A in the line y = 6.

Shade and label the image triangle B.

(ii) Using (4 , 6) as the centre of rotation, rotate triangle A through 180˚.

Shade and label the image triangle C.

(iii) Draw a fourth triangle so that the pattern made from the triangles has rotational symmetry of order 2.

Shade and label this triangle D.

17. Stuart is organising a school trip to Disneyland. There are 380 pupils going on the trip. 45% of these are boys.

(i) Write 45% as a fraction in its lowest form.

Answer: (i) _____

(ii) Work out the number of boys going on this trip.

Answer: (ii) _____

18. Calculate 42.3 ÷ 9.4

Answer: _____

19. Solve each of the following equations:

(a) $5\chi = 12$

Answer: (a) χ = _____

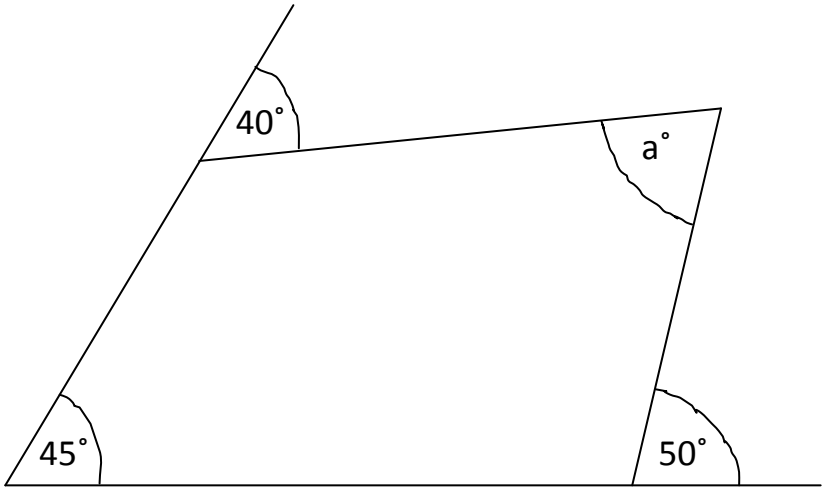
(b) $8\chi - 1 = 39$

Answer: (b) χ = _____

(c) $4\chi + 3 = 2(\chi - 3)$

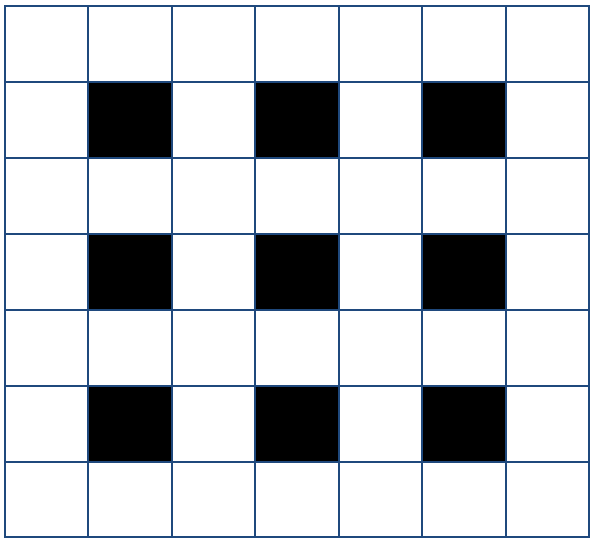
Answer: (c) χ = _____

20. Calculate the angle a in the diagram below **[diagram not drawn to scale]**



Answer: a = _____

21. The table below shows a square board in which strips of white squares alternate with trips of black and white squares. A larger board is to be made in the same way. If it has 36 black squares, how many white squares will there be on a larger board?



Answer: _____

22. Look at the pattern shown below. The number 15 is directly below the number 9. If the pattern is continued, what number will appear directly below the number 100?

			1			
		2	3	4		
	5	6	7	8	9	
10	11	12	13	14	15	16

Answer: _____

Now check through your work carefully!