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THE PERSE

UPPER SCHOOL

CAMBRIDGE

Year 9 Entrance Exams

Maths

Specimen Paper 1

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. Multiply 607 by 508

Answer: _____

2. (a) Simplify $m^2 \times m^7$

Answer: (a)_____

(b) Multiply out and simplify the following

$7(x + 4) - 3(2x - 1)$

Answer: _____

3. How many minutes are there in 0.4 hours?

Answer: _____

4. (a) Find the value of $2^3 \times 5^2$

Answer: (a)_____

(b) Write 300 as a multiplication of prime numbers, leaving your answer in a form that involves indices as in part (a)

Answer: (b) _____

5. The height of the Eiffel tower is 2.95 x 10^2m. What is this in millimetres? Leave your answer in scientific form.

Answer: _____mm

6. Solve $\frac{x}{3}+x=28-x$

Answer: x = _____

7. Calculate 5.06 x 7.2

Answer: _____

8. In this question, a = -3, b = 4 and c = 2

   Calculate the value of each of the following

   (i) a^3 Answer: (i) _____

   (ii) 2ab Answer: (ii) _____

   (iii) $(3c - 2a)^2$ Answer: (iii) _____

9. (i) Express 6 ¼ as a top heavy fraction

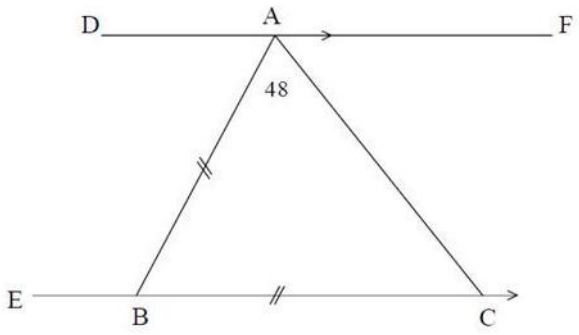
Answer: (i) _____

(ii) Hence find the square root of 6 ¼

Answer: (ii) _____

10. In the diagram shown opposite, DF is parallel to EC and AB is equal in length to BC.

Angle BAC = 48˚



Calculate:

(i) Angle ABC

Answer: ∠ _____

(ii) Angle BAD

Answer: ∠ _____

(iii) Angle ABE

Answer: ∠ _____

11. The table below gives information about pupils in a school

	Left handed	Right handed
Boys	103	447
Girls	87	363

(a) How many pupils are there in the school?

Answer: (a) _____

(b) What % of the school are left handed?

Answer: (b) _____

(c) What is the ratio of boys to girls? **[Leave your answer in the form p : q where p and q have no common factor]**

Answer: (c) _____

12. Two boxes inside a larger box both have five boxes inside them. How many boxes are there in total?

Answer: _____

13. Write 0.225 as a fraction in its lowest terms.

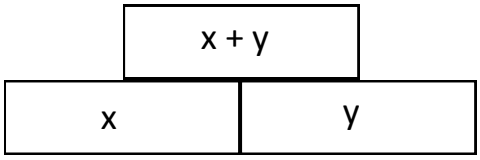
Answer: _____

14. The sum of two numbers is 100. The different between them is 56. What is the larger number?

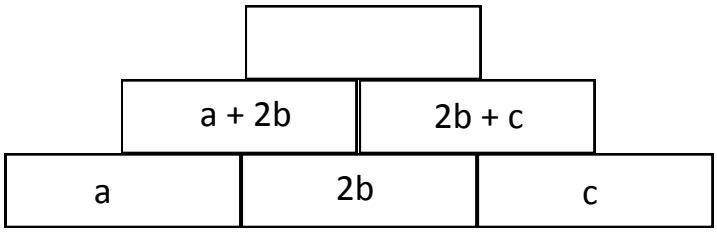
Answer: _____

15. In these walls, the value of each brick is made by adding the value of the two bricks below it.

i.e.

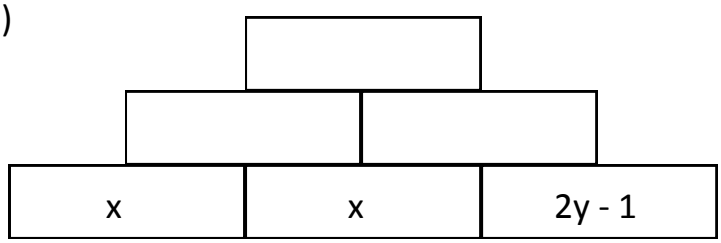


(a) Write a simplified expression for the number in the top brick of the wall shown below:

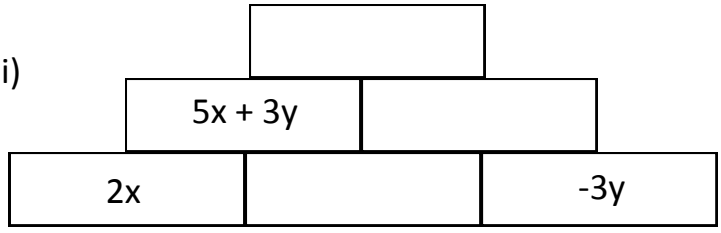


(b) Fill in the missing expressions in each of the walls shown below: **(write your answers in a simplified form)**

(i)



(ii)



16. Calculate each of the following **[leave fractions in their lowest form]**

(a) $\frac{2}{3} + \frac{7}{12}$

Answer: _____

(b) $\frac{3}{4} - \frac{1}{4} \times \frac{2}{5}$

Answer: _____

(c) $\frac{7}{9} \div 1\frac{2}{5}$

Answer: _____

17. Write down the next number in each of the following sequences:

(a) 1, 6, 11, 16, 21, _____

(b) $\frac{1}{25}$, $\frac{1}{5}$, 1, 5, 25, _____

(c) 45, 90, 30, 120, 24, _____

18. Simplify each of the following algebraic expressions:

(a) $\frac{6t \times 5t}{15t^2}$

Answer: (a) _____

(b) $6y \times 4y - 7y^2$

Answer: (b) _____

(c) $\frac{x}{4} + \frac{x}{3}$

Answer: (c) _____

19. In this question, take $\pi = 3.14$

The school groundsman uses a roller to maintain a level playing field. The roller has a cylinder of diameter 80cm.

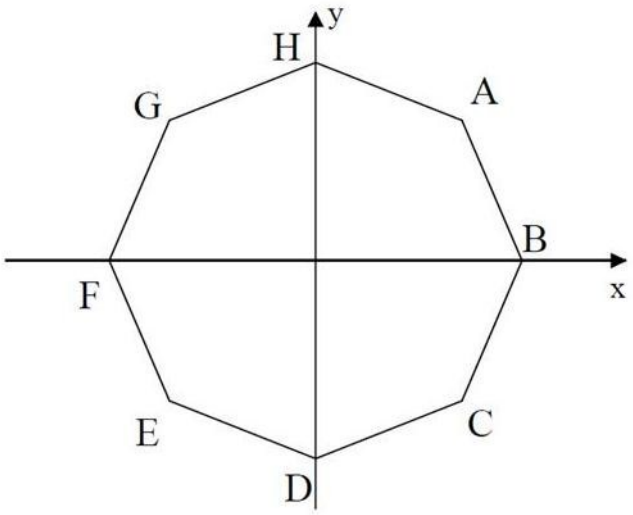
(a) He pushes the roller round exactly once. How far has the roller moved?

Answer: (a) _____cm

(b) The groundsman pushes the roller forward 12560cm. Calculate how many turns the cylinder goes round.

Answer: (b) _____turns

20. The diagram shows a regular octagon with axes at its centre.



The line through A and C has equation x = 5

(a) What is the equation of the line through E and C?

Answer: (a) _____

(b) What is the equation of the line through A and E?

Answer: (b) _____

(c) What is the equation of the line through H and D?

Answer: (c) _____

21. In this question, we define a new operation in arithmetic, using ☼ as a symbol.

a ☼ b = ab + a - b

For example, 3 ☼ 7 = 21 + 3 - 7 = 17

(i) Calculate 5 ☼ 2

Answer: (i) _____

(ii) Calculate 3 ☼ ½

Answer: (ii) _____

(iii) Solve the equation x ☼ 5 = 8

Answer: (iii) x = _____

Now check through your work carefully!