THE PERSE SCHOOL
CAMBRIDGE

Year 9 (13+) Entrance Assessments

Sample Maths Paper 1

Instructions to candidates

Time allowed: 45 minutes

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 on - 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. How many minutes are there in 0.4 hours?

Answer: _____

3. (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) _____

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4. The height of the Eiffel tower is 2.95×10^2m. What is this in millimetres? Leave your answer in scientific (standard) form.

Answer: _____mm

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

Answer: x = _____

6. Calculate 5.06 x 7.2

Answer: _____

7. 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) _____

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

Angle BAC = 48˚

Calculate:

(i) Angle ABC

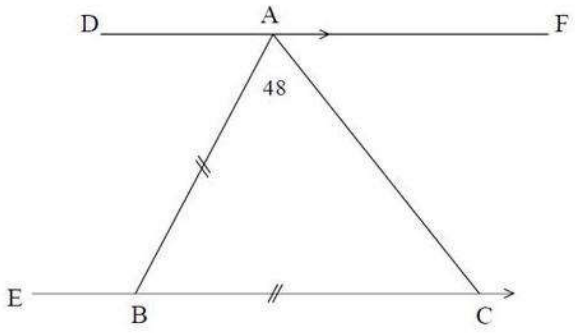
Answer: _____

(ii) Angle BAD

Answer: _____

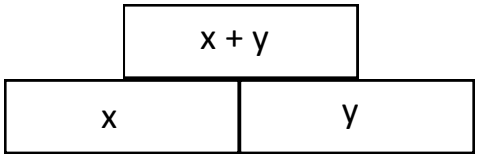
(iii) Angle ABE

Answer: _____

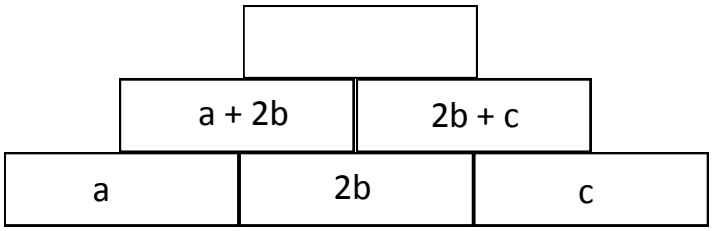


9. In these walls, the value of each brick is made by adding the value of the two bricks below it.

i.e.

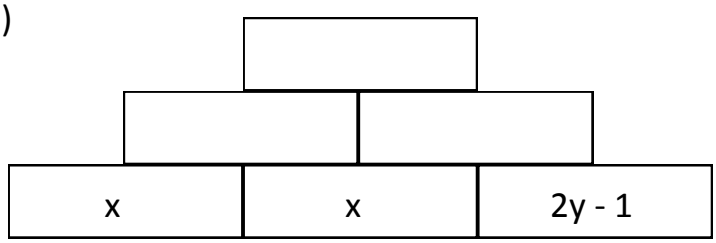


(a) Write a simplified expression for the number in the top brick of the wall shown below:

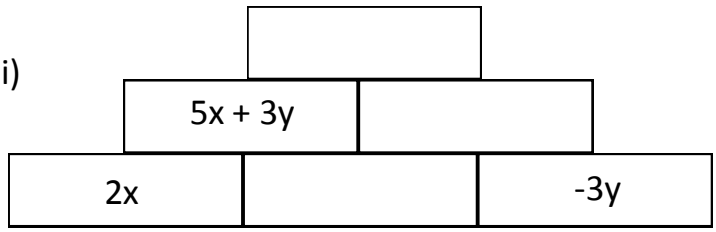


(b) Fill in the missing expressions in each of the walls shown below: **(write your answers in a simplified form)**

(i)



(ii)



10. 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: _____

11. The SINGLESUM of a number is obtained by repeatedly adding its digits until a single digit remains.

For example, the SINGLESUM of 2482 is 7 because:

2+4+8+2 = 16 then 1+6=7

(a) Write down the SINGLESUM of 998.

Answer: _____

(b) Find an odd number between 200 and 220 with SINGLESUM equal to 1.

Answer: _____

A number is called SPECIAL if its SINGLESUM is 4 or 7. For example, 4 and 7 are SPECIAL, as is 133 because 1+3+3=7.

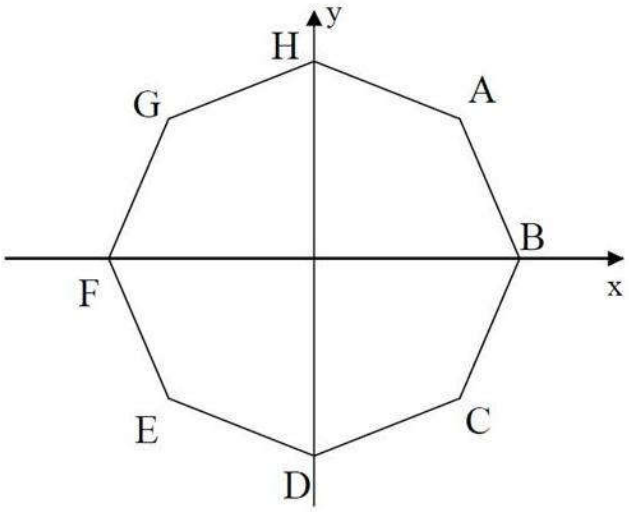
(c) Is 4444 SPECIAL?

Answer: _____

(d) Find all the SPECIAL numbers between 60 and 80.

Answers: _____

12. 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) _____

13. 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!