Name:

OUNDLE
School

2021 Junior Entrance Examination
Second Form Entry

Mathematics

Time Allowed: 60 minutes

Instructions

- Attempt all questions.
- All working and answers must be shown on this paper. Marks will be given for demonstrating your method.
- Do not spend too long working on any particular question. Do not worry if you do not manage to complete every question.
- You may work in pen or pencil.
- Calculators are **NOT** permitted.

Question 1

(a) A submarine is 1456.8m below the surface of an ocean, and the submarine's sonar indicates that the ocean bed is 567.4m below the submarine.
How deep is the ocean at this point?

Answer ……………………………. [1]

(b) A shipping container holds 132 crates, and each crate contains 18 boxes.
How many boxes does the shipping container hold?

Answer ……………………………. [1]

(c) 324 pineapples are each cut into 72 chunks, then put into tin cans which hold 24 chunks each.
How many tin cans will be needed?

Answer ……………………………. [2]

(d) Interest is earned at a rate of 7% per year.
How much interest is earned on a starting balance of £2558, deposited for one year?

Answer ……………………………. [2]

(e) Subtract four sevenths from four ninths.

Answer ……………………………. [2]

Question 2

Calculate each of the following

(a) $1 + 4 - 3 \times 2$

Answer ……………………………. [1]

(b) $3 + 2 \div 5 - 1$

Answer ……………………………. [2]

(c) $5 - (8 - (4 - 6))$

Answer ……………………………. [2]

Question 3

If $x = -3$, $y = 1$ and $z = -2$, find the value of

(a) $2x - y + z$

Answer ……………………………. [2]

(b) xy

Answer ……………………………. [2]

(c) $-4x^2$

Answer ……………………………. [2]

(d) $3xz - y^3$

Answer ……………………………. [2]

Question 4

(a) I think of a number, then subtract thirteen. The result is seventeen.
What was the original number?

Answer ………………………… [1]

(b) I think of a number, multiply it by five, then subtract three. The result is negative thirty eight.
What was the original number?

Answer ………………………… [2]

(c) I think of a number, subtract twelve, then halve it. The result is negative three.
What was the original number?

Answer ………………………… [2]

Question 5   Solve the following equations, giving your answers as whole numbers or fractions.

(a) $2x - 9 = 7x + 6$

Answer ……………………………. [2]

(b) $\frac{1}{3}x + 2 = \frac{5x}{6} + 4$

Answer ……………………………. [2]

Question 6

At a concert, the ratio of adults to children is 3:5
If there are 4682 more children than adults, what is the total attendance at the concert?

Answer ……………………………. [2]

Question 7

Four identical rectangles are placed edge to edge to form a square with an area of 100 cm^2.
Find the perimeter of one of the rectangles.

Answer ……………………………. [2]

Question 8

A number is said to be a palindrome if it reads backwards the same as forwards.
How many five-digit whole numbers are palindromes?
The first digit of a number cannot be 0.

Answer ……………………………. [3]

Question 9

A group of friends in a café order 3 cups of tea and 5 cups of coffee, with a total cost of £15.90. After four of the group left, the remaining friends ordered another 2 cups of tea and 2 cups of coffee, with a total cost of £7.80. What is the price of a single cup of tea?
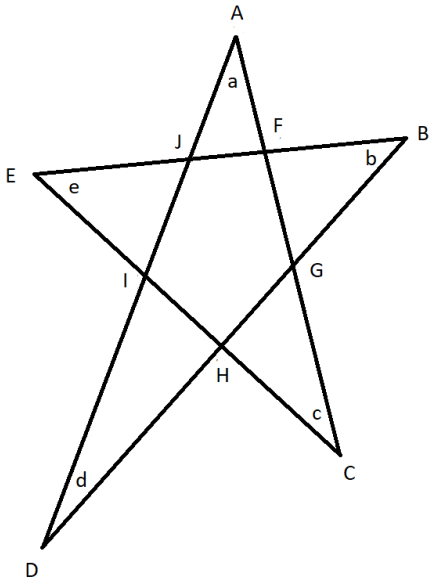
Answer ……………………………. [3]

Question 10

A class of 14 students take a test and the mean of their scores is 65%. One student took the paper at a later date, and when their result was included the mean went up to 67%.
What percentage did the late student get on the test?

Answer ……………………………. [3]

Question 11

A five-pointed star is shown below, with the angles formed at each of the points labelled a, b, c, d, and e.

(a) By considering the triangle JBD, show that angle $A\hat{J}F = b + d$

[2]

(c) Hence, or otherwise, determine the value of the sum of the angles at the five points, $a + b + c + d + e$.

Answer …………………………. [2]