

Name:



2020 Non Common Entrance
Third and Fourth Form Entry

Mathematics

Time Allowed: 60 minutes

Instructions

- **Calculators are NOT permitted**
- Write ALL your working and answers on this paper. Show enough working on each question to make it clear how you reached your answer.
- 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.

Question 1

- (a) Peter bought three presents for his friends which cost £12.97, £9.85 and £17.23.
Quentin bought two presents costing £25.64 and £13.59.
Who spent the most in total, and by how much?

Answer

- (b) A box contains 37 chocolates.
How many chocolates are there in 23 of these boxes?

Answer

- (c) Apples are sold at a price of £4.27 per kilogram.
Some apples are selected and weighed and put in a bag.
If the bag of apples weighs 0.35 kilograms, how much will it cost?

Answer

- (d) Thirty seven identical coins weigh 20.35 grams.
What does one coin weigh?

Answer

Question 2 Work out the following, obeying the correct order of operations.

(a) $1 - 0 + (-1)$

Answer

(b) 0×-7

Answer

(c) $9 + 1 \times 0$

Answer

(d) $5 + 0 \div 1$

Answer

(e) $-1 \times 3 + 5 \times (-3)$

Answer

(f) $5 - 5 - 5 \div 5$

Answer

(g) $3 - (3 \div 3 + 3)$

Answer

(h) $56 \div 2 \div 4 \times 3$

Answer

(i) $2 \div 5 - 4 \div 10$

Answer

Question 3 Where possible, fully simplify the following algebraic expressions

(a) $3x - 2x$

Answer

(b) $x + x$

Answer

(c) $x + 5x - 7 - 3x - 9$

Answer

(d) $7x \times x \times 4x$

Answer

Question 4 Write down, in ascending order, all factors of the following numbers.

(a) 36

Answer

(b) 54

Answer

Question 5 Write down the prime factorisation of the following numbers

(a) 72

Answer

(b) 360

Answer

Question 6 Calculate the following:

(a) $\frac{1}{4} \times \frac{3}{5}$

Answer

(b) $\frac{5}{6} - \frac{5}{4}$

Answer

(c) $\frac{5}{6} \div \frac{5}{4}$

Answer

(d) $\frac{40}{21} \times \frac{35}{8}$

Answer

Question 7

A solid wooden cube is painted blue on the outside. The cube is then cut into eight smaller cubes of equal size. What fraction of the total surface area of these new cubes is blue?

Answer

Question 8 Solve the following equations, leaving your answers as improper fractions where necessary.

(a) $5x - 13 = 32$

Answer

(b) $\frac{x}{2} - 3 = \frac{1}{2}$

Answer

(c) $2 + \frac{2x-3}{4} = 7$

Answer

(d) $3x - 6 = 12 - 9x$

Answer

(e) $6(13x - 5) = 48$

Answer

(f) $4x - \frac{3}{4} = \frac{1}{3}x + 5$

Answer

Question 9

If $a = 4$, $b = -1$ and $c = -2$, find the value of the following expressions

(a) abc

Answer

(b) bc^2

Answer

(c) $3a - 2b - 4c$

Answer

Question 10

You should solve the following questions by defining an unknown, forming an equation and solving it using an algebraic method.

- (a) Six times a number is ten less than eight times the number.
Find the number.

The number is

- (b) John thought of a number. He added twenty-four and then divided by three.
The result was the same as when multiplying the original number by three and then adding four.
What number did John think of?

John's number was

Question 11

In a 7–digit numerical code each group of four adjacent digits adds to 16 and each group of five digits adds to 19. What is the sum of all seven digits?

Sum of all seven digits =