

Name:



2018 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) A sandwich costs £2.46. A drink costs £1.29.
What is the combined cost?

Answer

- (b) A box of chocolates contains 37 individual chocolates.
How many chocolates are there, in total, in 18 of the same boxes?

Answer

- (c) One litre of orange juice costs £1.45.
What does 0.65 litres of orange juice cost?

Answer

- (d) There are 1.09 yards in one metre. How many yards are there in 0.27 metres?

Answer

- (e) The total mass of 7 identical computers is 259 kg. What is the mass of one computer?

Answer

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

(a) $-1 + 0$

Answer

(b) 0×2

Answer

(c) $3 - 3 \times 0$

Answer

(d) $2 + 0 \div 2$

Answer

(e) $-1 \times 3 + 3 \times 2$

Answer

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

Answer

(g) $3 - (3 - 3 \times 3)$

Answer

(h) $12 \div 4 \div 3 \times 2$

Answer

(i) $1 \div 2 - 4 \div 6$

Answer

Question 3 Where possible, fully simplify the following algebraic expressions

(a) $x \div x$

Answer

(b) $x - x$

Answer

(c) $x + 2x - 3 - 4x + 9$

Answer

(d) $5x \times x \times 2x$

Answer

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

(a) 36

Answer

(b) 150

Answer

Question 5 Write down the prime factorisation of the following numbers

(a) 36

Answer

(b) 150

Answer

Question 6 Calculate the following:

(a) $\frac{1}{7} \times \frac{4}{3}$

Answer

(b) $\frac{1}{7} - \frac{4}{3}$

Answer

(c) $\frac{1}{7} \div \frac{4}{3}$

Answer

(d) $\frac{63}{21} \times \frac{35}{99}$

Answer

Question 7

A chocolate bar is shared amongst two friends.
Alfred first eats one third of the bar. Barbara then eats two thirds of the remaining chocolate.
What fraction of the original chocolate bar is left?

Answer

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

(a) $5x - 11 = 34$

Answer

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

Answer

(c) $3 + \frac{2x-3}{7} = 8$

Answer

(d) $6x - 9 = 15 - 7x$

Answer

(e) $5(x - 6) = 25$

Answer

(f) $3x - 9 = \frac{1}{4}x + \frac{1}{2}$

Answer

Question 9

If $a = 6$, $b = -2$ and $c = -5$, 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) Five times a number is eight less than three times the number.
Find the number.

The number is

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

John's number was

- (c) The width of a rectangle is four times its height.
The perimeter is 12 cm.
Find the dimensions of the rectangle.

The rectangles dimensions are