

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Algebra

Substituting into expressions

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

- In all calculations, show clearly how you work out your answer

For question 1 you must **NOT** use a calculator.



Q1.

x and y are two **different positive** numbers.
For each statement, choose the correct box

	Always true	Sometimes true	Never true
$x + y$ is positive	☐	☐	☐
$x - y$ is negative	☐	☐	☐

(Total 2 marks)

For the rest of the questions, you **may** use a calculator.



Q2.

Work out the value of $x^2 + 7x$ when $x = -4$

(Total 2 marks)

Q3.

Work out the value of $3r + 4t$ when $r = 13$ and $t = -2$

(Total 2 marks)

Q4.

Work out the value of $a^2 - 4a$ when $a = 10$

(Total 2 marks)

Q5.

Circle the expression that has the **smallest** value when $x = 4$

$5 - x$ $x + 1$ $x - 4$ $\frac{1}{2}x$

(Total 1 mark)

Q6.

p is a positive number.

n is a negative number.

For each statement, choose the correct box.

	Always true	Sometimes true	Never true
$p + n$ is positive	☐	☐	☐
$p - n$ is positive	☐	☐	☐
$p^2 + n^2$ is positive	☐	☐	☐
$p^3 \div n^3$ is positive	☐	☐	☐

(Total 4 marks)

Q7.

n is negative.

Circle the expression that is **positive**.

$n - 1$

n^2

n^3

$\frac{1}{n}$

(Total 1 mark)

Q8.

Choose **one** of the following to make a correct statement each time.

is less than

is equal to

is greater than

When $a = 3$

$4a$

$a + 7$

When $b = 8$

$2b - 6$

$18 - b$

When $c = 0.5$

$3c$

$c + 1$

When $d = -1$

d

d^2

(Total 4 marks)

Q9.

x is a **negative** number.

Which statement is correct?

Tick **one** box.

☐

$x + 10$ is always positive

☐

$x + 10$ is always negative

☐

$x + 10$ cannot be zero

☐

x could be positive or negative or zero

(Total 1 mark)

Q10.

The value of x can be 2 or 5

The value of y can be 3 or 12

(a) List the possible values of xy

(2)

(b) Work out the **least** possible value of $\frac{x-y}{x}$

You **must** show your working.

(2)

(Total 4 marks)

Question 11 is **higher** tier only

Q11.

Circle the expression that has the **largest** value when $a < -1$

$$\frac{1}{2}a$$

$$a$$

$$a^2$$

$$a^3$$

(Total 1 mark)

Substituting into expressions – Cross-topic questions

Q12.

Here are two expressions.

$$8a$$

$$a^2 - b$$

When $a = 25$ the expressions have the same value.

Work out the value of b .

(Total 3 marks)