C3

Calculations and order

CHAPTER ASSIGNMENT · 52 MARKS

Name _____ Class _____ No. _____ Date _____

Answer every question in the space given. Work the order-of-operations questions in your head or on paper first, then check on a calculator.

Practice questions from *Cambridge IGCSE Mathematics Core and Extended* (4th edition), Chapter 3 (Calculations and order), for classroom use. Questions that used a number line in the book describe it in words. The Check yourself and Chapter quiz questions are Guru Jazzy's own.

Exercise 3.1 · Symbols and inequalities

3.1.1 Write =, > or < in each gap to make the statement correct.

Statement	Symbol	Statement	Symbol
$7 \times 2 \ldots 8 + 7$		80 cm … 1 m	
$6^2 \ldots 9 \times 4$		1000 litres … 1 m^3	
$5 \times 10 \ldots 7^2$		$48 \div 6 \ldots 54 \div 9$	

3.1.2 Show each inequality on a number line, where x is a real number. Use ● for included and ○ for not included. [8]

(a) $x < 2$ · (b) $x \geq 3$ · (c) $x \leq -4$ · (d) $x \geq -2$

(e) $2 < x < 5$ · (f) $-3 < x < 0$ · (g) $-2 \leq x < 2$ · (h) $-1 \leq x \leq 2$

3.1.3 Write the inequality shown by each number line. [4]

(a) An open circle at 2 and an arrow going right.

(b) A filled circle at 1, a line to an open circle at 3.

(c) A filled circle at 3 and an arrow going left.

(d) An open circle at 0, a line to a filled circle at 4.

3.1.4 Write each sentence as an inequality. Say what your letter stands for. [6]

(a) The maximum capacity of an athletics stadium is 20 000 people.

(b) In a class, the tallest student is 180 cm and the shortest is 135 cm.

(c) Five times a number plus 3 is less than 20.

(d) The maximum temperature in May was 25 °C.

(e) A farmer has between 350 and 400 apples on each tree.

(f) In December, temperatures in Kenya were between 11 °C and 28 °C.

Exercise 3.2 · Order of size

3.2.1 Write these decimals in order, smallest first: 6.0, 0.6, 0.66, 0.606, 0.06, 6.6, 6.606 **[2]**

3.2.2 Write these fractions in order, largest first: 1/2, 1/3, 6/13, 4/5, 7/18, 2/19 **[2]**

3.2.3 Write these lengths in order, smallest first: 2 m, 60 cm, 800 mm, 180 cm, 0.75 m **[2]**

3.2.4 Write these masses in order, largest first: 4 kg, 3500 g, ¾ kg, 700 g, 1 kg **[2]**

3.2.5 Write these volumes in order, smallest first: 1 l, 430 ml, 800 cm^3, 120 cl, 150 cm^3 **[2]**

Exercise 3.3 · The order of operations

3.3 Work out each answer in your head, then check with a scientific calculator.

Calculation	Answer	Calculation	Answer	Calculation	Answer
$8 \times 3 + 2$		$7 \times 2 + 3 \times 2$		$(4 + 5) \times 3$	
$4 \div 2 + 8$		$12 \div 3 + 6 \times 5$		$8 \times (12 - 4)$	
$12 \times 4 - 6$		$9 + 3 \times 8 - 1$		$3 \times (-8 + -3) - 3$	
$4 + 6 \times 2$		$36 - 9 \div 3 - 2$		$(4 + 11) \div (7 - 2)$	
$10 - 6 \div 3$		$-14 \times 2 - 16 \div 2$		$4 \times 3 \times (7 + 5)$	
$6 - 3 \times 4$		$4 + 3 \times 7 - 6 \div 3$		$24 \div 3 \div (10 - 5)$	

Exercise 3.4 · Putting in brackets

3.4.1 Copy each calculation and put in any brackets needed to make it correct. Check on a calculator.

Calculation	With brackets
$6 \times 2 + 1 = 18$	
$1 + 3 \times 5 = 16$	
$8 + 6 \div 2 = 7$	
$9 + 2 \times 4 = 44$	
$9 \div 3 \times 4 + 1 = 13$	
$3 + 2 \times 4 - 1 = 15$	

3.4.2 Put in brackets so that $12 \div 4 - 2 + 6$ gives each answer, and $4 + 5 \times 6 - 1$ gives each answer.

$12 \div 4 - 2 + 6 = 7$	$12 \div 4 - 2 + 6 = 12$	$12 \div 4 - 2 + 6 = -5$	$12 \div 4 - 2 + 6 = 1.5$
$4 + 5 \times 6 - 1 = 33$	$4 + 5 \times 6 - 1 = 29$	$4 + 5 \times 6 - 1 = 53$	$4 + 5 \times 6 - 1 = 45$

Exercise 3.5 · Brackets on a calculator

3.5 Use a scientific calculator. Write the keys you press for the first two, then the answers. Give answers to 2 d.p. where needed.

Calculation	Answer
$(9 + 3) \div 6$	
$(30 - 6) \div (5 + 3)$	
$(40 + 9) \div (12 - 5)$	
$(20 + 12) \div 4^2$	
$(90 + 38) \div 4^3$	

Calculation	Answer
$(4^2 - 6) \div (2 + 8)$	

Student assessment

A1 Evaluate: (a) 6 × 8 − 4 · (b) 3 + 5 × 2 · (c) 3 × 3 + 4 × 4 · (d) 3 + 3 × 4 + 4 · (e) (5 + 2) × 7 · (f) 18 ÷ 2 ÷ (5 − 2) **[6]**

A2 Use brackets, if needed, to make each statement correct: (a) 7 − 4 × 2 = 6 · (b) 12 + 3 × 3 + 4 = 33 · (c) 5 + 5 × 6 − 4 = 20 · (d) 5 + 5 × 6 − 4 = 56 **[4]**

A3 Illustrate on a number line: (a) $x \geq 3$ · (b) $x < 4$ · (c) $0 < x < 4$ · (d) $-3 \leq x < 1$ **[4]**

A4 Write these fractions in order, smallest first: 4/7, 3/14, 9/10, 1/2, 2/5 **[2]**

Check yourself

1 Explain why 10 − 6 ÷ 3 is 8 and not 4/3. **[2]**

2 A student types 12 + 9 ÷ 10 − 3 into a calculator to work out (12 + 9) over (10 − 3). What answer do they get, and what should they type? **[3]**

3 Write an inequality for “at least 5 and fewer than 9”, and say where the circles are filled or open on a number line. [2]

4 Write a calculation using 2, 3 and 4 once each that equals 20 only if you use brackets. [1]

Chapter quiz

Q1 What is 2 + 3 × 4?

A	B	C	D
9	14	20	24

Q2 What is (2 + 3) × 4?

A	B	C	D
9	14	20	24

Q3 What is 36 − 9 ÷ 3 − 2?

A	B	C	D
7	9	31	35

Q4 Which inequality says the same as 5 > x?

A	B	C	D
x > 5	x < 5	x ≥ 5	x ≤ 5

Q5 On a number line, which inequality is shown with a filled circle?

A	B	C	D
$x > 3$	$x < 3$	$x \geq 3$	$x \neq 3$

Q6 Which list is in order, smallest first?

A	B	C	D
0.6, 0.06, 0.606, 0.66	0.06, 0.6, 0.606, 0.66	0.06, 0.606, 0.6, 0.66	0.66, 0.606, 0.6, 0.06

Q7 Which of these lengths is the longest?

A	B	C	D
180 cm	2 m	800 mm	0.75 m

Q8 Where do brackets go to make $6 \times 2 + 1 = 18$ correct?

A	B	C	D
$(6 \times 2) + 1$	$6 \times (2 + 1)$	$(6 \times 2 + 1)$	No brackets needed

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End of assignment · Check your answers against the chapter at gurujazzy.com/subjects/o-level-mathematics/chapter-3-calculations-and-order/