∑ DANEMATHICS
FREE CAPS MATHS RESOURCES

GRADE 8 · FUNCTIONS AND RELATIONSHIPS

Functions & Relationships: Flow Diagrams, Tables and Formulae

EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
33	50 minutes	3

Name: _____ Class: _____

Date: _____

MARK _____ / 33

INSTRUCTIONS AND INFORMATION

1. Answer **ALL** the questions in this question paper.
2. Answer QUESTION 1 by **circling** the letter (A–D) in the answer grid at the end of that section.
3. Show **ALL** calculations clearly.
4. Show all units where applicable.
5. Number the answers correctly according to the numbering system used in this question paper.
6. A non-programmable calculator may be used, unless stated otherwise.
7. Write neatly and legibly.

QUESTION 1 [10 MARKS]

Four options are given as possible answers to the following questions. Choose the correct answer and circle the letter (A–D) in the grid at the end of this section. If you want to change your choice, put a cross through the wrong letter and circle your new choice.

1.1 A flow diagram multiplies the input by 3 and then adds 1. When the input is 5, the output is ... (1)

A) 16 **B)** 15
C) 9 **D)** 18

1.2 For the same rule, which input gives an output of 25? (1)

A) 8 **B)** 75
C) 26 **D)** 24

1.3 The rule "multiply by 3, then add 1" written as a formula is ... (1)

A) $y = x + 3$ **B)** $y = 3 + x + 1$
C) $y = 3x + 1$ **D)** $y = 3(x + 1)$

1.4 Working BACKWARDS through a flow diagram, you must ... (1)

A) use the same operations in the same order **B)** use the inverse operations in the same order
C) double every operation **D)** use the INVERSE operations in the REVERSE order

1.5 For $y = 4x - 3$, the value of y when $x = 5$ is ... (1)

A) 20 **B)** 17
C) -17 **D)** 23

1.6 For $y = 4x - 3$, the value of x when $y = 25$ is ... (1)

A) 97 **B)** 5,5

C) 22 **D)** 7

1.7 A rule gives the outputs 3 ; 5 ; 7 ; 9 for the inputs 1 ; 2 ; 3 ; 4. The rule is ... (1)

A) $y = x + 2$ **B)** $y = 3x$

C) $y = 2x + 1$ **D)** $y = 2x$

1.8 For $y = x^2 + 1$, the value of y when $x = 4$ is ... (1)

A) 16 **B)** 25

C) 9 **D)** 17

1.9 For $y = x^2 + 1$, which input ALSO gives $y = 17$? (1)

A) -17 **B)** -4

C) 17 **D)** there is no other

1.10 Which of the following is NOT a way of showing the same relationship? (1)

A) a flow diagram **B)** a formula

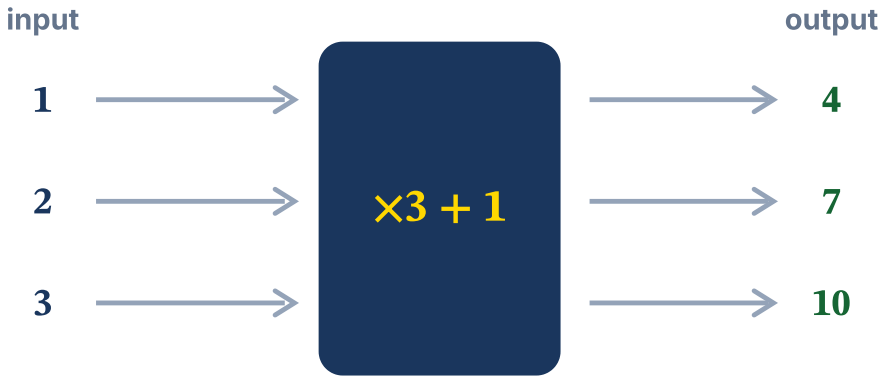
C) the answer alone **D)** a table

ANSWER GRID — CIRCLE YOUR ANSWERS FOR QUESTION 1

1.1	A	B	C	D
1.2	A	B	C	D
1.3	A	B	C	D
1.4	A	B	C	D
1.5	A	B	C	D
1.6	A	B	C	D
1.7	A	B	C	D
1.8	A	B	C	D
1.9	A	B	C	D
1.10	A	B	C	D

QUESTION 2 **[11 MARKS]**

The flow diagram below shows a rule applied to three input values.



2.1 Write down the output value when the input is 5, and the input value that produces an output of 25. **(3)**

2.2 Write the rule as a formula in the form $y = \ldots$, and state what the 3 and the 1 each do to the input. **(3)**

2.3 Determine the input value if the output is 31. **(3)**

2.4 Explain why working backwards through a flow diagram means using the INVERSE operations in the opposite order. **(2)**

QUESTION 3 [12 MARKS]

The same relationship can be written as a rule in words, a flow diagram, a table or a formula. Answer the questions below on the rule $y = 4x - 3$.

3.1 Determine the value of y when $x = 5$, and the value of x for which $y = 25$. **(3)**

3.2 Determine the value of x when $y = 17$. **(3)**

3.3 A different rule gives the outputs 3; 5; 7; 9 for the inputs 1; 2; 3; 4. Determine the rule in the form $y = \ldots$ **(3)**

3.4 For the rule $y = x^2 + 1$, determine y when $x = 4$, and explain why $x = -4$ gives the same value of y. **(3)**

TOTAL: 33 marks

This question paper consists of 3 questions.

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