

**Year 7 Mathematics 2015**

**Algebra and Problem Solving**

*Mark scheme*

**Total marks: 67** **Name**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Using the starting number and the rule given, write the next **two** numbers in each pattern.
   1. 6; add 4

14*scheme*

10 *scheme*

\_\_\_\_\_ \_\_\_\_\_ [2]

* 1. 9; multiply by 3

81 *scheme*

27 *scheme*

\_\_\_\_\_ \_\_\_\_\_ [2]

1. For each pattern, write the next number **and the rule** used to find that number.
   1. 2, 9, 16, 23, ….

add 7

30 *scheme*

\_\_\_\_\_ *rule:* \_\_\_\_\_ [2]

* 1. 120, 60, 30, ….

÷ 2

15

\_\_\_\_\_ *rule:* \_\_\_\_\_ [2]

1. Find the number represented by each pronumeral.

7

\_\_\_\_\_ [1]

6

\_\_\_\_\_ [1]

1. Matches have been used to make the following figures.

1

2

3

4

* 1. Complete the table below.

✓✓ all correct

✓ at least 2 correct

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Figure ,** | 1 | 2 | 3 | 4 |
| **Number of matches,** | 7 | 10 | 13 | 16 |

[2]

* 1. Complete the rule that links the number of matches, M, to the figure number, N, in each figure.

4

3

\_\_\_\_\_ \_\_\_\_\_

[2]

1. Rewrite each expression in its simplest form.

4ab

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Find the value of each expression if

30

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

36

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

11

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

3

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. If and , evaluate:

✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. Complete the table of values for the rule

✓✓ all correct

✓ at least 2 correct

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 |
|  | 1 | 4 | 7 | 10 |

[2]

1. How many terms are there in each expression?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Simplify each expression.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

***Show your method clearly when solving each of the following problems***

***Remember to read each question carefully***

1. On a quiz show, Miriam earned $25 for each correct answer and lost $15 for each incorrect answer (or for questions she couldn’t answer). After 20 questions had been asked, Miriam had $20.

How many questions had she answered correctly?

✓ appropriate method

8✓✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. When two numbers are multiplied the answer is 437. Both of these numbers are greater than 1.

Find these two numbers.

✓ appropriate method

23✓

19✓

\_\_\_\_\_ \_\_\_\_\_ [3]

1. How many **different** three digit numbers can be found using three of the digits 3, 4, 5, 6 only once in each number?

✓ appropriate method

24✓✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. Isini, Sara, Araina and Tanisha each have one brother, Darren or Andrew or Evan or Kevin.

Isini is neither Andrew’s nor Evan’s sister.

Sara is neither Darren’s nor Kevin’s sister.

Araina is neither Andrew’s nor Kevin’s sister.

Darren is not Tanisha’s brother.

If Evan is Araina’s brother, whose brother is Kevin?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Darren | Andrew | Evan | Kevin |
| Isini | ✓ | x | x | x |
| Sara | x | ✓ | x | x |
| Araina | x | x | ✓ | x |
| Tanisha | x | x | x | ✓ |

✓ appropriate method

Tanisha✓✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. A rectangular garden, which measures 12 m × 9 m, is to have a fence built right around the perimeter. The fence posts are to be spaced one metre apart. If there must be a post at each of the four corners of the garden, how many posts will be needed altogether?

✓ appropriate method

42✓✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. At its first stop, 2 passengers get on a train, at its second stop 6 passengers get on, at its third stop 10 passengers get and so on. How many passengers got on at the 17th stop?

✓ appropriate method

|  |  |  |  |
| --- | --- | --- | --- |
| Stop, S | 1 | 2 | 3 |
| No. passengers, P | 2 | 6 | 10 |

66✓✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. Ten mathematicians meet at a conference. Each mathematician shakes hand with every other mathematician. How many handshakes were there altogether?

✓ appropriate method

9+8+7+6+5+4+3+2+1

45✓✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. I think of a number, add three to it, multiply this result by 2, subtract 4 then divide by 7. The number I end up with is 2. What was the number I first thought of?

✓ appropriate method

6✓✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

1. I am trying to work out David’s age. He told me that if I add 6 to his age, then multiply by 3, add another 17 then divide by 8 I will end up at his sister Susie’s age which is twice his brother Bill’s age which is 5 years old. How old is David?

✓ appropriate method

15✓✓

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3]

**THE END**