

Walt complete number patterns and find the rule for each pattern

Success Criteria I can understand the sequence of the pattern given and make up a rule

1 For each of the following number patterns:

i Describe in words how the pattern is formed.

ii Write down the next three numbers in the pattern.

a 2, 4, 6, 8, ___ **b** 4, 7, 10, 13, ___ **c** 27, 23, 19, 15, ___
d 30, 28, 26, 24, ___ **e** 90, 80, 70, 60, ___ **f** 3, 6, 12, 24, ___
g 2, 6, 18, 54, ___ **h** 3, 30, 300, 3000, ___ **i** 1, 0.1, 0.01, 0.001, ___
j 128, 64, 32, 16, ___

2 Find the missing numbers in the following patterns.

a 3, 5, ___, 9, ___ **b** 2, 5, ___, 11, ___ **c** 4, ___, 10, ___, 16
d 30, 26, ___, 18, ___ **e** 51, ___, 47, ___, 43 **f** 2, 10, ___, 250, ___
g 2, ___, 8, ___, 32 **h** 625, 125, ___, 5, ___ **i** 800, 400, ___, ___, 50
j 3, ___, 300, ___, 30 000


Walt Build patterns and create a rule

Success Criteria I know I can create a pattern and a rule associated with the pattern.

All patterns have a sequence that can predict future patterns.

EXAMPLE 1

Form a sequence of numbers by using each rule given.

a Start with 5 and add 3. *Some number patterns need more than one operation.* 

b Start with 1000 and divide by 2.

c Start with 2, multiply by 3 and then add 1.

	1st term	2nd term	3rd term	4th term
a	5	$5 + 3 = 8$	$8 + 3 = 11$	$11 + 3 = 14$

So the sequence is 5, 8, 11, 14, ...

	1st term	2nd term	3rd term	4th term
b	1000	$1000 \div 2 = 500$	$500 \div 2 = 250$	$250 \div 2 = 125$

So the sequence is 1000, 500, 250, 125, ...

	1st term	2nd term	3rd term	4th term
c	2	$2 \times 3 + 1 = 7$	$7 \times 3 + 1 = 22$	$22 \times 3 + 1 = 67$

So the sequence is 2, 7, 22, 67, ...

- 1** Using the rule given, find the first four terms of each number sequence.
- | | |
|---|---|
| a Start with 2 and add 3. | b Start with 5 and add 2. |
| c Start with 1 and add 4. | d Start with 100 and subtract 10. |
| e Start with 45 and subtract 3. | f Start with 50 and subtract 2. |
| g Start with 3 and double the preceding term. | h Start with 7 and multiply by 10. |
| i Start with 1 and multiply by 3. | j Start with 64 and divide by 2. |
| k Start with 2 and divide by 10. | l Start with 1, multiply by 4 and then add 1. |
| m Start with 3, multiply by 2 and then add 1. | n Start with 5, multiply by 2 and then subtract 4. |
| o Start with 2, multiply by 4 and then subtract 5. | p Start with 7, multiply by 2 and then subtract 9. |

- 2** If 1 L of paint covers approximately 16 m^2 , what area could be covered by:

- | | |
|---------------|---------------|
| a 1 L? | b 2 L? |
| c 3 L? | d 4 L? |
| e 5 L? | |

- 3** The height of a candle decreases by 1.5 cm every hour. If the candle is originally 10 cm high, what will be its height after:

- | | |
|---------------|---------------|
| a 1 h? | b 2 h? |
| c 3 h? | d 4 h? |
| e 5 h? | |



- 4** The cost of hiring a taxi is \$5 plus \$3.50 for each kilometre travelled. How much does it cost to travel:

- | | | | | |
|----------------|----------------|----------------|----------------|----------------|
| a 1 km? | b 2 km? | c 3 km? | d 4 km? | e 5 km? |
|----------------|----------------|----------------|----------------|----------------|

- 5** The time taken to roast a piece of meat is 20 min plus an extra 15 min for each $\frac{1}{2}$ kg of meat. How long will it take to roast a piece of meat that weighs:

- | | | | | |
|----------------------------|----------------|-----------------------------|----------------|-----------------------------|
| a $\frac{1}{2}$ kg? | b 1 kg? | c $1\frac{1}{2}$ kg? | d 2 kg? | e $2\frac{1}{2}$ kg? |
|----------------------------|----------------|-----------------------------|----------------|-----------------------------|

Check your answers

EXERCISE 14C

- 1** **a** 2, 5, 8, 11, ... **b** 5, 7, 9, 11, ...
c 1, 5, 9, 13, ... **d** 100, 90, 80, 70, ...
e 45, 42, 39, 36, ... **f** 50, 48, 46, 44, ...
g 3, 6, 12, 24, ... **h** 7, 70, 700, 7000, ...
i 1, 3, 9, 27, ... **j** 64, 32, 16, 8, ...
k 2, 0.2, 0.02, 0.002, ... **l** 1, 5, 21, 85, ...
m 3, 7, 15, 31, ... **n** 5, 6, 8, 12, ...
o 2, 3, 7, 23, ... **p** 7, 5, 1, -7, ...
- 2** **a** 16 m^2 **b** 32 m^2 **c** 48 m^2
d 64 m^2 **e** 80 m^2
- 3** **a** 8.5 cm **b** 7 cm **c** 5.5 cm
d 4 cm **e** 2.5 cm
- 4** **a** \$8.50 **b** \$12 **c** \$15.50
d \$19 **e** \$22.50
- 5** **a** 35 min **b** 50 min **c** 65 min
d 80 min **e** 95 min
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