

# Division Algorithm

2012

Q10 – 3 marks

Use the division algorithm to express  $1234_{10}$  in base 7.

3

Marking Instructions

Method 1

$$1234 = 7 \times 176 + 2$$

$$176 = 7 \times 25 + 1$$

$$25 = 7 \times 3 + 4$$

Hence

$$1234_{10} = 3412_7$$

Method 2

$$1234 = 7 \times 176 + 2$$

$$= 7 \times (7 \times 25 + 1) + 2$$

$$= 7 \times (7 \times (7 \times 3 + 4) + 1) + 2$$

$$= 3 \times 7^3 + 4 \times 7^2 + 1 \times 7 + 2$$

Hence

$$1234_{10} = 3412_7$$

1

1

1

answer only. 1 of 3

1

1

1

answer only. 1 of 3

$$1234 = 176 \times 7 + 2$$

$$176 = 25 \times 7 + 1$$

$$25 = 3 \times 7 + 4$$

$$3 = 0 \times 7 + 3$$



$$\therefore \underline{\underline{3412_7}}$$

base 10 structure is  
Th H T U  
base 7 is  
 $7^3 \ 7^2 \ 7^1 \ 7^0$