



4.3F Prime Factors, HCF and LCM: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 50 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

1 Which of the following numbers is a prime number? 15, 17, 21

☐ 15

☐ 17

☐ 21

(Total for Question 1 is 1 mark)

2 Write down the two prime numbers that multiply together to make 35.

(Total for Question 2 is 1 mark)

3 Write down the prime factorisation of 12 using powers if appropriate.

(Total for Question 3 is 1 mark)

4 Complete a prime factor tree for 45 and write the prime factorisation.

(Total for Question 4 is 2 marks)

5 Work out the highest common factor (HCF) of 18 and 24.

(Total for Question 5 is 1 mark)

6 Work out the lowest common multiple (LCM) of 4 and 6. Show your method.

(Total for Question 6 is 2 marks)

7 Find the highest common factor (HCF) of 28 and 35. Show your working.

(Total for Question 7 is 2 marks)

8 Write the prime factorisation of 84.

(Total for Question 8 is 2 marks)

9 Work out both the HCF and the LCM of 12 and 30. Show your working.

(a) Find the HCF of 12 and 30. (2)

(b) Find the LCM of 12 and 30. (2)

(Total for Question 9 is 4 marks)

10 Is 1 a prime number? Write down yes or no.

☐ Yes

☐ No

(Total for Question 10 is 1 mark)

11 What is the smallest prime factor of 91?

(Total for Question 11 is 1 mark)

- 12** Complete the prime factorisation and then use it to find the HCF of 48 and 72.

Prime factorisation: $48 = \underline{\hspace{1cm}}$, $72 = \underline{\hspace{1cm}}$

(Total for Question 12 is 3 marks)

- 13** Sam has 30 red sweets and 18 blue sweets. She wants to make identical small bags with no sweets left over and each bag must contain sweets of only one colour. What is the largest possible number of sweets in each bag? Explain your reasoning.

(Total for Question 13 is 2 marks)

- 14** Three bus services start together at 9:00. One bus comes every 12 minutes, the second every 15 minutes and the third every 20 minutes. After how many minutes will they next all arrive together at the stop?

(Total for Question 14 is 2 marks)

- 15** Find the smallest positive integer n such that $\text{LCM}(n, 6) = 60$. Show how you find n .

(Total for Question 15 is 3 marks)

16 Find the HCF and the LCM of 8, 12 and 20. Show your method.

(a) Find the HCF of 8, 12 and 20.

(2)

(b) Find the LCM of 8, 12 and 20.

(2)

(Total for Question 16 is 4 marks)

17 Use prime factorisation to find the HCF of 90 and 126. Show the prime factorisations you use.

(Total for Question 17 is 3 marks)

Mark scheme · 4.3F Prime Factors, HCF and LCM: Foundation Tier Practice

Question 1

- **B1** 17 cao
- **Answer:** 17

Question 2

- **B1** 5 and 7 cao
- **Answer:** 5 and 7

Question 3

- **B1** $2^2 * 3$ cao
- **Answer:** $2^2 * 3$

Question 4

- **M1** correct factor tree or method shown, e.g. $45 = 9 * 5$, $9 = 3 * 3$
- **A1** $3^2 * 5$ cao
- **Answer:** $3^2 * 5$

Question 5

- **B1** 6 cao
- **Answer:** 6

Question 6

- **M1** method to find LCM using multiples or prime factors, e.g. multiples 4,8,12 and 6,12 or prime factors 2^2 and $2*3$
- **A1** 12 cao
- **Answer:** 12

Question 7

- **M1** correct method shown, e.g. prime factors $28 = 2^2 * 7$ and $35 = 5 * 7$ or listing factors
- **A1** 7 cao
- **Answer:** 7

Question 8

- **M1** correct method or factors shown, e.g. $84 = 12 * 7$, $12 = 3 * 4$
- **A1** $2^2 * 3 * 7$ cao
- **Answer:** $2^2 * 3 * 7$

Question 9

- (a) **M1** method shown, e.g. prime factors $12 = 2^2 * 3$ and $30 = 2 * 3 * 5$
- (a) **A1** 6 cao
- (a) **Answer:** 6
- (b) **M1** method shown, e.g. take highest powers 2^2 , 3, 5 or list multiples
- (b) **A1** 60 cao
- (b) **Answer:** 60

Question 10

- **B1** No, 1 is not a prime number cao
- **Answer:** No

Question 11

- **B1** 7 cao
- **Answer: 7**

Question 12

- **M1** correct prime factorisations, e.g. $48 = 2^4 * 3$ and $72 = 2^3 * 3^2$ (or equivalent shown)
- **M1** use factors to identify common prime powers, e.g. common 2^3 and 3^1
- **A1** $HCF = 2^3 * 3 = 8 * 3 = 24$ cao
- **Answer: $48 = 2^4 * 3$, $72 = 2^3 * 3^2$, $HCF = 24$**

Question 13

- **M1** method to find HCF of 30 and 18, e.g. factors or prime factors $30 = 2 * 3 * 5$, $18 = 2 * 3^2$
- **A1** 6 cao with explanation
- **Answer: 6 (HCF of 30 and 18 is 6; so each bag can have 6 sweets)**

Question 14

- **M1** method to find LCM of 12, 15 and 20, e.g. prime factors $12=2^2*3$, $15=3*5$, $20=2^2*5$
- **A1** 60 minutes cao
- **Answer: 60 minutes**

Question 15

- **M1** use prime factors: $6 = 2 * 3$ and $60 = 2^2 * 3 * 5$, show need for extra 2 and 5
- **M1** deduce n must provide the missing prime powers, e.g. must have 2^2 and 5
- **A1** $n = 20$ cao
- **Answer: 20**

Question 16

- (a) **M1** method shown, e.g. prime factors $8=2^3$, $12=2^2*3$, $20=2^2*5$ and take common powers
- (a) **A1** 4 cao
- (a) **Answer: 4**
- (b) **M1** method shown, take highest powers 2^3 , 3, and 5
- (b) **A1** 120 cao
- (b) **Answer: 120**

Question 17

- **M1** correct prime factorisations, e.g. $90 = 2 * 3^2 * 5$ and $126 = 2 * 3^2 * 7$
- **M1** identify common prime powers, here 2 and 3^2
- **A1** $HCF = 2 * 3^2 = 18$ cao
- **Answer: 18**