Name	Date

GCSE Mathematics 9-1

HIGHEST COMMON FACTOR + LOWEST COMMON MULTIPLE

Instructions

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name and date number.
- Answer all questions.
- Answer the questions in the spaces provided – there may be more space than you need.
- You must show all your working.
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- Calculators may **not** be used.

Information

- The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

1 Write 84 as a product of its prime factors

.....

(1)

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2 Write 180 as a product of its prime factors.

.....

(1)

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3 Write 252 as a product of its prime factors.

.....

(1)

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4 Write 315 as a product of its prime factors.

.....

(1)

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5 Write 490 as a product of its prime factors.

.....

(1)

Total (5 marks)

6 Find the lowest common multiple (LCM) of 18 and 24.

.....

(2)

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7 Find the lowest common multiple (LCM) of 45 and 60.

.....

(2)

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8 Two buses leave a station at the same time. One returns every 40 minutes, the other every 56 minutes. After how many minutes will they return together?

.....

(2)

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9 Find the LCM of 84 and 120.

.....

(2)

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10 A gardener waters plants every 15 days. Another gardener waters them every 20 days. After how many days will they water them together?

.....

(2)

Total (5 marks)

11 Find the highest common factor (HCF) of 28 and 42.

.....

(2)

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12 Find the highest common factor (HCF) of 96 and 120.

.....

(2)

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13 Two metal rods are 144 cm and 180 cm in length. They are cut into equal pieces. What is the greatest possible length of each piece?

.....

(2)

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14 Find the HCF of 252 and 378.

.....

(2)

---

15 A baker has 84 chocolate muffins and 126 vanilla muffins. He wants to put them into identical boxes with no muffins left over. What is the greatest number of boxes he can make?

.....

(3)

Total (11 marks)

16 (a) Write 72 as a product of prime factors.

.....

(1)

(b) Find the HCF of 72 and 108.

.....

(2)

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17 (a) Write 210 as a product of prime factors.

.....

(1)

(b) Find the LCM of 210 and 315.

.....

(2)

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18 Find the LCM of 96 and 132.

.....

(2)

Total (8 marks)

20 (a) Write 150 as a product of its prime factors.

.....

(1)

(b) Find the LCM of 150 and 225.

.....

(2)

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21 (a) Find the HCF of 144 and 216.

.....

(2)

(b) Find the LCM of 144 and 216.

.....

(2)

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22 Find the HCF of 168 and 252.

.....

(2)

Total (9 marks)

23 (a) Write 540 as a product of its prime factors.

.....

(1)

(b) Find the LCM of 540 and 420.

.....

(2)

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24 (a) Find the HCF of 288 and 360.

.....

(2)

(b) Find the LCM of 288 and 360.

.....

(2)

---

25 A concert repeats every 84 days. Another repeats every 120 days. Work out after how many days they will both occur on the same day.

.....

(3)

Total (9 marks)

26 Chocolates are sold in packets of 8.
Sweets are sold in packets of 6.
Cakes pens are sold in packets of 12.

Sophie wants to buy the same number of chocolates, sweets and cakes.

Work out the smallest number of each packet she should buy.

Chocolates .....

Sweets .....

Cakes .....

(3)

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27 Cupcakes are baked in trays of 9.
Muffins are baked in trays of 12.
Brownies are baked in trays of 15.

A baker wants to bake the same number of cupcakes, muffins and brownies.

Work out the smallest number of each tray he should use.

Cupcakes .....

Muffins .....

Brownies .....

(3)

Total (6 marks)

28 Here are three lamps.

lamp **A** lamp **B** lamp **C**

Light **A** changes every 30 seconds.
Light **B** changes every 50 seconds.
Light **C** changes every 75 seconds.

They all change at the same time at 12:00pm.
How many times in 3 hours will all three lights change at the same time?

.....

(3)

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29 $A = 2^4 \times 3^2 \times 5$ $B = 2^3 \times 3 \times 5^2$ $C = 2^2 \times 3^3 \times 5$

(a) Write down the HCF of *A, B* and *C*

.....

(3)

(a) Write down the LCM of *A, B* and *C*

.....

(3)

Total (9 marks)

30 A printer produces a small booklet every 28 minutes and a large booklet every 36 minutes.

Both booklets are printed at 9:00am.

At what time will both booklets next be printed together?

.....

(2)

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31 Here is a list of numbers

$$12^{15} \qquad 12^{20} \qquad 12^{25}$$

Find the lowest common multiple of these numbers.

.....

(1)

---

32 Here is a list of numbers

$$7^{18} \qquad 7^{24} \qquad 7^{36} \qquad 7^{42}$$

Find the highest common factor of these numbers.

.....

(1)

Total (4 marks)

33 Two buses leave a station at the same time.

Bus A returns every 48 minutes.
Bus B returns every 72 minutes.

They both return at the same time at 6:00am.
At what time will they next return together?

.....

(3)

---

34 A school has 96 boys and 120 girls.
They are to be put into groups.

Each group must have the same number of boys and the same number of girls.
What is the greatest number of groups the school can make?

.....

(3)

Total (6 marks)

35 Three bells ring together at 8:00am.

The first bell rings every 36 seconds.
The second bell rings every 48 seconds.
The third bell rings every 60 seconds.

How many times in 30 minutes will the three bells ring together?

.....

(3)

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36 Three fountains spray water at regular intervals.

Fountain A sprays every 25 seconds.
Fountain B sprays every 40 seconds.
Fountain C sprays every 50 seconds.

The three fountains all spray together at 2:00pm.
How many times in 1 hour will the three fountains spray together?

.....

(3)

Total (6 marks)