



Multiples and lowest common multiple

Year 7 About 60 minutes No calculator 49 marks

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark]

Write down the first five multiples of 7.

Answer

A2 Needed today [1 mark]

Write $\frac{3}{5}$ as a fraction with denominator 20.

Answer

- A3** Last lesson [1 mark]

Find the HCF of 24 and 40.

Answer

A4 From chapter 1 [1 mark]

Work out -9×-6 .

Answer

B Example, then your turn

Year 7

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

Find the lowest common multiple (LCM) of 12 and 18.

Hint List the multiples of each number until the same number appears in both lists.

- B1** Find the lowest common multiple (LCM) of 14 and 35. [2 marks]

Answer

EXAMPLE 2

Find the LCM of 4, 6 and 10.

Hint List the multiples of the largest number, 10. Stop at the first one that 4 and 6 both divide.

- B2** Find the LCM of 6, 9 and 15. [2 marks]

Answer

EXAMPLE 3

Work out $\frac{5}{6} + \frac{4}{9}$. Give your answer as a mixed number.

Hint Use the LCM of 6 and 8 as the common denominator.

B3 Work out

[4 marks]

(a) $\frac{7}{12} + \frac{2}{15}$

(b) $\frac{5}{8} - \frac{1}{6}$

Answer (a) (b)

EXAMPLE 4

Two lighthouses flash their lights. One flashes every 20 seconds and the other every 45 seconds. They flash at the same time at 9:00 pm. At what time do they next flash at the same time?

Hint They flash together again after a number of seconds that is a multiple of 20 and of 45.

B4 From a bus station, a number 7 bus leaves every 16 minutes and a number 9 bus leaves every 24 minutes. Both buses leave at 8:10 am. At what time do they next leave together?

[3 marks]

Answer

EXAMPLE 5

Two numbers have an HCF of 6 and an LCM of 36. Neither number is 6 or 36. Find the two numbers.

Hint Both numbers are multiples of 6 and factors of 36.

B5 Two numbers have an HCF of 4 and an LCM of 60. Neither number is 4 or 60. Find the two numbers.

[2 marks]

Answer

c Practice

Year 7

- C1** The pupils in Year 7 can be split into equal groups of 8, of 10 or of 12, with nobody left over. Work out the smallest number of pupils there could be in Year 7. [2 marks]

Answer

- C2** Find the HCF and the LCM of 12 and 30. Show that the HCF multiplied by the LCM is equal to 12×30 . [3 marks]

C3 The LCM of 6 and a number n is 42. n is an odd number greater than 10. Find n . [2 marks]

Answer

C4 Red bricks are 30 mm tall, blue bricks are 45 mm tall and green bricks are 50 mm tall. Three towers are built, one from each colour, all the same height. What is the smallest height they can be? Give your answer in centimetres. [2 marks]

Answer

C5 How many whole numbers from 1 to 100 are multiples of both 6 and 8? [2 marks]

Answer

D Exam-style questions

GCSE Foundation

D1 This question is about the numbers 18 and 24.

(a) Find the lowest common multiple (LCM) of 18 and 24. [2 marks]

Answer

(b) Find the highest common factor (HCF) of 18 and 24. [1 mark]

Answer

Total for D1: 3 marks

D2 Ben says, "The LCM of 10 and 14 is 140, because $10 \times 14 = 140$." [2 marks]

Ben is wrong. Explain why, and write down the correct LCM.

D3 Sausages are sold in packs of 12. Bread rolls are sold in packs of 20. Tom wants to buy exactly the same number of sausages and bread rolls.

- (a) Work out the smallest number of packs of sausages and the smallest number of packs of bread rolls he can buy. [3 marks]

Answer sausages rolls

- (b) A pack of sausages costs £2.40. A pack of bread rolls costs £1.15. Work out the cost of the packs in part (a). [2 marks]

Answer

Total for D3: 5 marks

D4 Three warning lights flash. The first flashes every 6 seconds, the second every 8 seconds and the third every 10 seconds. They all flash together at 9:00 pm.

- (a) How many seconds after 9:00 pm do they next all flash together? [2 marks]

Answer

- (b) How many times do they all flash together in the 15 minutes after 9:00 pm? Do not count the flash at 9:00 pm. [2 marks]

Answer

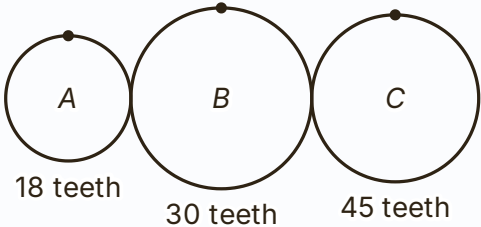
Total for D4: 4 marks

D5 Work out $\frac{3}{4} + \frac{5}{6}$. Give your answer as a mixed number. [3 marks]

Answer

No route is given. The hints are at the end of the sheet. Use one at a time.

E1 Three cogs turn together in a row. Cog *A* has 18 teeth, cog *B* has 30 teeth and cog *C* has 45 teeth. Each cog has a dot on one tooth, and the three dots start at the top. When one tooth of a cog moves past, one tooth of each other cog moves past. How many complete turns does each cog make before all three dots are back at the top at the same time for the first time? [4 marks]



Answer *A* ... *B* ... *C* ...

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Count the teeth that move past. The dot on cog *A* is back at the top after 18, 36, 54, ... teeth.
- Hint 2** You need the smallest number of teeth that is a multiple of 18, of 30 and of 45.
- Hint 3** The LCM of 18, 30 and 45 is 90. So *A* turns $90 \div 18 = 5$ times, *B* turns $90 \div 30 = 3$ times and *C* turns $90 \div 45 = 2$ times.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

- I can find the lowest common multiple of two or three numbers. ○ ○ ○
- I can use the LCM to add and subtract fractions. ○ ○ ○
- I can use the LCM to solve problems about things that happen together again. ○ ○ ○