

Factors and highest common factor

Year 7 About 60 minutes No calculator 49 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-factors-and-highest-common-factor/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark]

Work out $126 \div 9$.

Answer

A2 Needed today [1 mark]

Write $\frac{10}{25}$ in its simplest form.

Answer

- A3** Last lesson [1 mark]

Work out $-6 \times -7 \div -3$.

Answer

A4 Last lesson [1 mark]

Work out $(-2)^3 \times 5$.

Answer

B Example, then your turn

Year 7

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

EXAMPLE 1

Write down all the factors of 48.

Hint Find the factor pairs: 1×48 , 2×24 , and so on. Stop when the pairs start to repeat.

- B1** Write down all the factors of 84. [2 marks]
- Answer

EXAMPLE 2

Find the highest common factor (HCF) of 42 and 70.

Hint List the factors of each number, then find the largest number in both lists.

- B2** Write down all the common factors of 60 and 84. Then write down the HCF of 60 and 84. [3 marks]
- Answer ; HCF ...

EXAMPLE 3

Use the HCF to write $\frac{56}{84}$ in its simplest form.

Hint Find the HCF of 56 and 84. Divide the numerator and the denominator by it.

- B3** Use the HCF to write $\frac{52}{91}$ in its simplest form. [2 marks]
- Answer

EXAMPLE 4

A choir has 45 sopranos and 60 altos. The choir leader puts them into groups. Every group has the same number of singers, and sopranos and altos are not mixed. What is the largest possible size of a group? How many groups are there?

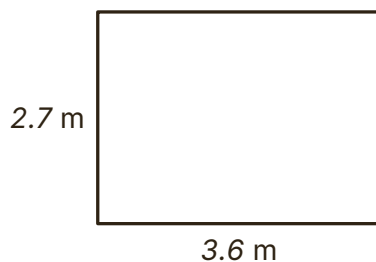
Hint A group size must divide 45 and 60 exactly, so it is a common factor. The largest is the HCF.

- B4** Raj has 72 red beads and 90 blue beads. He puts all of them into bags. Every bag holds the same number of red beads and the same number of blue beads. What is the largest number of bags he can fill? How many red beads and how many blue beads go in each bag? [3 marks]

Answer bags ... red ... blue ...

EXAMPLE 5

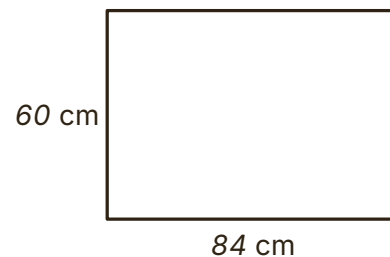
A floor is 3.6 m long and 2.7 m wide. It is covered with square tiles, all the same size, with no tiles cut. What is the side length of the largest tile that can be used? How many of these tiles are needed?



Not drawn accurately

Hint Change the lengths to centimetres so they are whole numbers. The tile side must divide both lengths.

- B5** A sheet of card measures 84 cm by 60 cm. It is cut into squares, all the same size, as large as possible, with no card left over. What is the side length of each square? How many squares are there? [3 marks]



Not drawn accurately

Answer side cm squares

c Practice

Year 7

- C1** Write down all the common factors of 36 and 90. [2 marks] **C2** Find the HCF of 39, 65 and 91. [2 marks]

Answer

Answer

C3 Which whole number from 30 to 40 has the most factors? Write down the number and how many factors it has. [2 marks]

Answer number factors

C4 Find the largest whole number that leaves a remainder of 2 when it is divided into 50 and when it is divided into 74. [2 marks]

Answer

C5 The HCF of 24 and a number n is 8. n is between 60 and 70. Find n . [2 marks]

Answer

D Exam-style questions

GCSE Foundation

D1 This question is about factors of 40.

(a) Write down all the factors of 40. [2 marks]

Answer

(b) Find the highest common factor (HCF) of 40 and 64. [1 mark]

Answer

Total for D1: 3 marks

D2 Sana says, "The HCF of 18 and 54 is 9, because 9 is a factor of both numbers." [2 marks]

Sana is wrong. Explain why, and write down the correct HCF.

D3 A florist has 84 roses and 126 tulips. She uses all of them to make bunches. Every bunch is the same: the same number of roses and the same number of tulips.

(a) Work out the greatest number of bunches she can make. [2 marks]

Answer

(b) How many roses and how many tulips are in each bunch?

[2 marks]

Answer roses and tulips

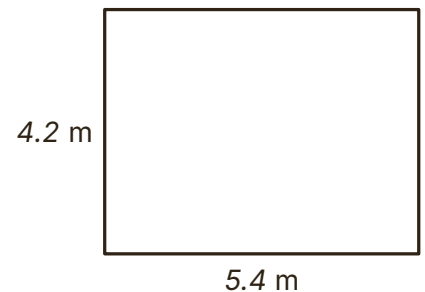
(c) The next day she has 84 roses, 126 tulips and 35 lilies. She makes bunches in the same way, using all three kinds of flower. Work out the greatest number of bunches she can make. [2 marks]

Answer

Total for D3: 6 marks

D4 A rectangular hall floor is 5.4 m long and 4.2 m wide. It is covered with square tiles, all the same size, with no tiles cut. The tiles are as large as possible.

(a) Work out the side length of each tile, in centimetres. You must show your working. [3 marks]



Answer

(b) How many tiles are needed? [1 mark]

Not drawn accurately

Answer

Total for D4: 4 marks

D5 Two ribbons are 96 cm and 156 cm long. They are cut into pieces that are all the same length, as long as possible, with no ribbon left over. How many pieces are there altogether? You must show your working. [3 marks]

Answer

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

- E1** The HCF of two numbers is 18. The larger number is 54 more than the smaller number. Both numbers are less than 100. Find every possible pair of numbers. [4 marks]

Answer and and

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Both numbers are multiples of 18. List the multiples of 18 below 100.
- Hint 2** The multiples are 18, 36, 54, 72, 90. Pick pairs that differ by 54.
- Hint 3** 18 and 72, and 36 and 90, differ by 54. Check each HCF is 18, not more: both are 18.

How did it go?

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

- I can list all the factors of a number. ☐ ☐ ☒
- I can find the highest common factor of two or three numbers. ☐ ☐ ☒
- I can use the HCF to simplify fractions and solve sharing problems. ☐ ☐ ☒