Hcf and lcm questions and answers ks3

September 2, 2019 corbettmaths What is the HCF of \({16}\) and \({40}\)? The \({16}\) factors are \({1}\), \({2}\), \({4}\), \({8}\) and \({16}\). The factors of \({40}\) are \({1}\), \({2}\), \({4}\), \({5}\), \({8}\), \({10}\), \({20}\) and \({40}\). Thus, the HCF of \({16}\) and \({40}\) is \({8}\). arrow_back Back to The Biggest Common Factor, Multiple Common Lower If you want a homework, some cover work, or a bit of extra lovely practice, this is the place for you. And best of all they all (well, most!) come up with answers. Mathster Content is a great resource for creating online and paper-based reviews and tasks. They kindly allowed me to create 3 editable versions of each worksheet, complete with answers. The spreadsheet name 12 3 factors, multiples and primes, LCM and HCF 1 2 3 Corbett Maths keyboard_arrow_up Back to Top Corbett Maths offers original examination style questions on any topic, as well as videos, past and 5-a-day work. It's really one of the best sites around. We define a prime factor of any number to be any factor that the number has, which is also a prime number. Each positive integer has a unique primordial factorization – a list of prime numbers that, when multiplied together, give it the original number. In more complicated cases, we use something called the factor tree. Example: Determine the primary factoring of 60. Step 1: To build a factor tree, think of 2 numbers that multiply together to make 60 – here, we went with 10 and 6. Step 2: Draw two branches down from 60, and at the end of the branches write the two factors you have chosen. Step 3: If a factor is prime, then circle it. If a factor is not prime, then repeat the process as shown in the factor tree below. Step 4: The primordial factorization of 60 is therefore 60 = 2 \times 2 \times 3 \times 5 Step 5: We write this primordial factoring in the form of index, where if there is more than one of the same factor, we write as a power instead, where the power is the number of times it occurs. Thus, 60= 2^2 \times 3\times 5 The highest common factor, or HCF, of two numbers is the largest number that goes to both. Example: Consider the numbers 12 and 20 The factors of 12 are: 1, 2, 3, 4, 6 and 12 Factors of 20 are: 1, 2, 4, 5, 10 and 20 They have some factors in common, but the biggest factor they have in common is 4, so 4 is the HCF of 12 and 20. The smallest common multiple, or LCM, of two numbers is the smallest number that is a multiple of both. Example: Consider the numbers 5 and 7 Multiples of 5 are: 5, 10, 15, 20, 25, 30, 35, 40, 45, ... Multiples of 7 are: 7, 14, 21, 28, 35, 42, ... and so on. So we can see that the first occurrence of a number that is a multiple of these two numbers is 35, so 35 is lcm of 5 and 7. For large numbers, the easiest way to find HCF and lCM is to use Venn diagrams. Example: Find the HCF and LCM of 60 and 27. Step 1: First we need the cousin of both numbers, in which we would use factor trees. However, we already have the primordial factorization of 60, which is 60 = 2 \times 2 \times 3 \times 5 = 2^2 \times 3 \times 5 and 27= 3 \times 3 \ 3 = 3^3 Step 2: Now we draw a Venn diagram where a circle is for prime factors of 60 and a circle is for prime factors of 27. Step 3: Looking at the list of factors, if one is shared by both numbers, then let's put it at the intersection and scratch it from both lists. \textcolor{red}{60} = 2 \times 2 \times \bcancel{3} \times 5 and \textcolor{blue}{ 27} = \bcancel{3} \times 3 \times 3 Step 4: Any factors that are not shared and were not risks, we put in their respective circles. Step 5: To find the HCF, we multiply the numbers at the intersection (these are the factors that are common between both numbers). Here there is only one number, so HCF = 3 Step 6: To find the LCM, we multiply all the numbers in the Venn diagram together. Then LCM = 2 \times 2 \times 5 \times 3 \times 3 \times 3 Find LCM and HCF of 420 and 132. [4 brands] To make this method, we require the complete privileged factoring of 420 and 132. So let's use the tree factor method. The main factor tree for 420 can be seen on the right, This gives, 2\times2\times3\times 5\times 7 = 2^2 \times 3 \times 7 Going through the same process, we have that the complete main factoring of 132 is 2\times2\times 3\times 11 = 2^2 \times 3 \times 11 So now that we have the main factoring, we need to draw a Venn diagram where a circle is for prime factors of 420 and a circle is for factors cousins of 132. Looking at the lists of factors, if one is shared by both numbers, then let's put it at the intersection and scratch it from both lists. So all factors that are not shared, and so were not risks, will be placed in their respective circles. To find the HCF is to multiply the numbers at the intersection: HCF =2\times2\times3=12 To find the LCM, all we need to do is multiply all the numbers now in the Venn diagram together: LCM =5\times7\times2\times 2\times3\times11=4620 The main factors of a number can be displayed using a main factor tree. The primary factoring of 72 is, 72=2\times2\times2\times3\times3 Written in index notation, the answer is: 72=2^3\3\3^2 The main factors of a number can be displayed using a main factor tree. The primary factoring of 140 is, 140=2\times2\times5\times7 Written in index notation, the answer is, 140=2^2\times5\times7 First, we have to find the primordial factorization of 24 and 40: Prime factors of 24: 2\times2\times2\times3 Prime factors of 40: 2\times2\times2\times5 To find the HCF, find any prime factors that are common between both numbers. HCF = 2\times2\times2=8 Then cross all the numbers used so far of the products. Prime factors of 24: 40 prime factors: \cancel{2}\times\cancel{2}\times\cancel{2}\times5 To find LCM, multiply the HCF by by factors that have not been used so far. LCM = 8\times3\times5=120 The main factors of 495 and 220 can be displayed using main factor trees. Thus, the factoring of 220 is, 220=2\times2\times5\times11 and the factoring of 495 is, 495=3\times3\times5\times11 Now, let's draw a Venn diagram with a circle containing the factors of 495 and the other containing the factors of 220. Any prime factors shared by these two numbers must be placed at the intersection. 495=3\times3\times\cancel5\times\cancel11 220=2\times2\times\cancel5\times\cancel11 HCF can be calculated by multiplying the numbers at the intersection together, \text{HCF }=5\times11=55 Finally, we find the LCM multiplying all the numbers of the Venn diagram together, \text{LCM }=3\times3\times11\times2\times2=1,980 First, we have to find the primordial factoring of 32, 152 and 600: Prime factors of 32=2\times2\times2\times2\times2Prime factors of 152= 2\times2\times2\times19 prime factors of 600= 2\times2\times3\times5\times5\55 So we can put each prime factor in the correct circle in the Venn diagram. Any common factors should be placed at the intersections of the circles. The largest common factor (HCF) is found by multiplying the numbers at the intersection of the three circles. HCF = 2\times2\times2=8 The lowest common multiple (LCM) is found by multiplying the numbers of all sections of the circles. LCM = 2\times2\times2\times2\times2\times5\times5\times19=45600 Try a review board on this topic. Author: Ben Cooper This KS3 math worksheet is ideal for homework or class work, and focuses on the Highest Common Factor and Lowest Common Multiple. The goal is simply to be able to find the HCF and LCM of a couple of numbers. The outset encompasses factors and multiples and a few simple questions of HCF and LCM, and the extension then looks at perfect numbers. Download this feature here. 2nd | HCF LCM Codebreaker Author: Andy Lutwyche Discover the answer to the (terrible) joke by finding the highest common factor or the lowest common multiple of pairs of numbers. Can be used for KS3/4 or even for higher KS2. Download this feature here. 3rd | Review of the HCF LCM GCSE Author: David Morse This sheet covers the primordial factorization and localization of the HCF and LCM of two (or three) numbers, with exam-like questions that gradually increase in difficulty. Note that these questions cover the full range of skills tested in GCSE and IGCSE for this topic and there are some issues to resolve issues at the end. Detailed solutions are included, as well as a new PowerPoint style that allows questions and their solutions to be easily selected for extended display on one screen, one at a time – this makes it easier (and faster) to get through classroom solutions. Download this feature here. 4th | Corresponding Letters to KS3 Author: Ben Cooper This is a PowerPoint file with cards where students have to a card with two numbers to a card with one one common factor and lower common multiple. It is a great review tool for higher common factors and lower common multiples. Download this feature here. 5th | See the errors Author: Andy Lutwyche Clive seems to have gotten a little confused about prime factors, HCF and LCM. His homework involves five questions, all of which he missed. Can you help explain where he went wrong? This activity is designed to create mathematical discussion. Download this feature here. 6th | Treasure Hunt Author: David Morse This activity gives students practice in working LCM or HCF of two numbers. A treasure hunt is a great activity that children love. They are ideal for review, initiations or plenary. They're a great way to get students to answer questions quickly and enjoy doing so. Unlike most treasure hunts, this has the added feature that answers to questions give an encrypted clue. When students decipher this clue, it reveals where the treasure is hidden! The question letters were prepared in two sizes. The large version can be pinned around the room and used for an entire class activity. Smaller cards can be used for group work or by individuals. Smaller cards are particularly useful during interventions. Download this feature here. 7th | HCF Treasure Hunt Author: Simon Murphy Students receive a couple of numbers and ask to find the highest common factor. That's 10 questions in total. It comes as an editable text document and as a pdf. Download this feature here. 8th | HCF LCM's Dilemma of Batman Author: Andy Lutwyche Helps Batman with his weapons orders and

tidying up the Batcave – can you help Batman organize all his stuff? Download this feature here. 9th | Main factor decomposition Author: Ben Cooper A KS3 PowerPoint showing decomposition of prime factors and how to use it to find HCF and LCM. Download this feature here. 10th | GCSE Exam Style Questions Author: David Morse This is a carefully selected compilation of questions about the highest common factor and the lowest common multiple. The full range of skills expected at GCSE are addressed, including the location of the HCF and LCM of the numbers presented as a product of primes. There are detailed and fully annotated solutions that can be made available to students to spend at home. This can free up considerable time in class. Download this feature here. 11th | KS3 Factors and Spreadsheet HCF Author: Ben Cooper A simple factor worksheet for Stage 3. The match is three sets of various difficulty division issues, and there is an extension activity for students to look at square number factors. Download this feature here. 12th | Activity Phineas and Ferb HCF LCM Author: Andy Lutwyche Five HCF and LCM functional questions using the characters of Phineas and Ferb. All together in one PowerPoint and including answers. Now with a link to the song Phineas and Ferb! Download this feature here. 13th | Prime Decomposition HCF and LCM Author: Owen134866 Calculate the HCF and LCM of (or more) numbers using primordial decomposition and Venn diagrams. Download this feature here. 14th | LCM Xmas Party Author: Andy Lutwyche Andy hates having waste, so calculate how many people he should invite to the party to ensure he has no leftovers. Download this feature here. 15th | Home of Multiple Choice HCF Author: Ben Cooper A KS3 PowerPoint with 10 multiple choice questions about the highest common factors. Download this feature here. 16th | Loop Cards Author: David Morse This download contains four sets of cards. Students choose a set and sort them in order, answering questions. Then they try to do it faster using a different set, which has a different type order. Cards can be used by individuals, pairs, or small groups. Solutions and instructions are included. The size of the cutting card is approximately 65 x 90 mm. Download this feature here. 17th | LCM Multiple Choice Match Author: Ben Cooper 10 multiple choice questions about lower common multiples for KS3 math. Download this feature here. 18th | SANTA'S LCM Activity simplifying The author: Andy Lutwyche Santa doesn't want to waste this year, so work the smallest amount of each group of toys that are made in lots of different sizes. Download this feature here. Here.