

4.4 Homework

How to Find the *lcm* for Three Integers - FAST !

A demonstration using 10, 14, 20

STEP 1

Write the integers from left to right

10 14 20

STEP 2

Pull out any factor common to all integers,

2 | 10 14 20

STEP 3

Divide each of the three integers by the pulled out factor (if there was one)

2 | 10 14 20
 5 7 10

STEP 4

Repeat STEP 2 and STEP 3 until no factor is common to all three bottom row integers.
(Other than 1)

At this point you have found the *hcf*

For our example, $hcf\{10, 14, 20\} = 2$

STEP 5

Having found the *hcf* the method changes.

Look to see if there is any integer that goes into any pair of remaining integers.

For our example, 5 divides the bottom row 5 and 10.

2 | 10 14 20
5 | 5 7 10
 1 7 2

Observe that the 7, which isn't divisible by 5, is left as 7

STEP 6

Repeat STEP 5 until only 1 divides any two remaining integers.

In our example, as 1, 7 and 2 are pairwise coprime, we are already finished.

The *lcm* is now the pulled out numbers multiplied together along with the bottom row numbers.

Thus $lcm\{10, 14, 20\} = 2 \times 5 \times 1 \times 7 \times 2$
 $= 140$

Question 1

Use the Six-Step method to find,

(i) $hcf\{10, 25, 30\}$

(ii) $lcm\{10, 25, 30\}$

Check you answers agree with what you got in question 6 of exercise 4.2

Question 2

The method also works with two integers.

Use the Six-Step method to find,

(i) $hcf\{42, 63\}$

(ii) $lcm\{42, 63\}$

Question 3

Use the Six-Step method to find,

(i) $hcf\{14, 32, 40\}$

(ii) $lcm\{14, 32, 40\}$

Check you answers agree with what you got in question 7 of exercise 4.2

Question 4

Use the Six-Step method to find,

(i) $hcf\{12, 18, 30\}$

(ii) $lcm\{12, 18, 30\}$