



## HCF AND LCM EXAM-TYPE QUESTIONS

### NO CALCULATOR

Ref: G131. **3R1**

<p><b>A1</b> Express 204 as a product of its prime factors. Show your working clearly.</p>	<p><b>A2</b> Write 792 as a product of its prime factors. Show your working clearly.</p>	<p><b>A3</b> <math>1400 = 2^p \times 5^2 \times 7</math> Find the value of <math>p</math>.</p>	<p><b>A4</b> Given that <math>120 = 2^3 \times 3 \times 5</math> And that <math>n = 120 \times 108</math> Write <math>n</math> as a product of powers of its prime factors.</p>
<p><b>B1</b> Find the highest common factor (HCF) of 90 and 252</p>	<p><b>B2</b> Find the lowest common multiple (LCM) of 24 and 42</p>	<p><b>B3</b> Find the highest common factor (HCF) and lowest common multiple (LCM) of 168 and 180</p>	<p><b>B4</b> Find the highest common factor (HCF) and lowest common multiple (LCM) of 72, 180 and 540</p>
<p><b>C1</b> <math>A = 2^3 \times 3 \times 5^2</math> <math>B = 2^2 \times 3</math> Find the HCF and LCM of <math>A</math> and <math>B</math>.</p>	<p><b>C2</b> <math>M = 2^4 \times 3^2 \times 7</math> <math>N = 2^2 \times 3^2 \times 5</math> Find the HCF and LCM of <math>M</math> and <math>N</math>.</p>	<p><b>C3</b> <math>2520 = 2^3 \times 3^2 \times 5 \times 7</math> <math>3024 = 2^4 \times 3^3 \times 7</math> Find the HCF &amp; LCM of 2520 and 3024. Write your answer as a product of prime factors.</p>	<p><b>C4</b> <math>740\ 880 = 2^4 \times 3^3 \times 5 \times 7^3</math> <math>980\ 100 = 2^2 \times 3^4 \times 5^2 \times 11^2</math> Find the highest common factor (HCF) of 740 800 and 980 100</p>
<p><b>D1</b> The highest common factor (HCF) of 90 and <math>x</math> is 18 The lowest common multiple (LCM) of 90 and <math>x</math> is 540 Find the value of <math>x</math>.</p>	<p><b>D2</b> The highest common factor (HCF) of <math>x</math> and 12 is 6 The lowest common multiple (LCM) of <math>x</math> and 12 is 180 Find the value of <math>x</math>.</p>	<p><b>D3</b> Find two numbers between 100 and 150 that have a HCF of 22.</p>	<p><b>D4</b> <math>360 = 2^4 \times 3^2 \times 5</math> Write down three different factors of 360 with a sum between 90 and 100.</p>



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$$HCF \times LCM = A \times B \Rightarrow LCM = \frac{A \times B}{HCF}$$

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<p><b>A1</b> Express 204 as a product of its prime factors. Show your working clearly.</p> $204 = 2^2 \times 3 \times 17$	<p><b>A2</b> Write 792 as a product of its prime factors. Show your working clearly.</p> $792 = 2^3 \times 3^2 \times 11$	<p><b>A3</b> <math>1400 = 2^p \times 5^2 \times 7</math> Find the value of <math>p</math>.</p> $1400 = 2^3 \times 5^2 \times 7$ $\Rightarrow p = 3$	<p><b>A4</b> Given that <math>120 = 2^3 \times 3 \times 5</math></p> $108 = 2^2 \times 3^3$ $\therefore n = 2^3 \times 3 \times 5 \times 2^2 \times 3^3$ $= 2^5 \times 3^4 \times 5$
<p><b>B1</b></p> $252 = 2^2 \times 3^2 \times 7$ $90 = 2 \times 3^2 \times 5$ $HCF = 2 \times 3^2 = 18$	<p><b>B2</b></p> $42 = 2 \times 3 \times 7$ $24 = 2^3 \times 3$ $HCF = 2 \times 3$ $LCM = 2^3 \times 3 \times 7 = 168$	<p><b>B3</b></p> $168 = 2^3 \times 3 \times 7$ $180 = 2^2 \times 3^2 \times 5$ $HCF = 2^2 \times 3 = 12$ $LCM = 2^3 \times 3^2 \times 5 \times 7 = 2520$	<p><b>B4</b></p> $540 = 2^2 \times 3^3 \times 5$ $180 = 2^2 \times 3^2 \times 5$ $72 = 2^3 \times 3^2$ $HCF = 2^2 \times 3^2 = 36$ $LCM = 2^3 \times 3^3 \times 5 = 1080$
<p><b>C1</b></p> $A = 2^3 \times 3 \times 5^2$ $B = 2^2 \times 3$ $HCF = 2^2 \times 3 (= 12)$ $LCM = 2^3 \times 3 \times 5^2 (= 600)$	<p><b>C2</b></p> $M = 2^4 \times 3^2 \times 7$ $N = 2^2 \times 3^2 \times 5$ $HCF = 2^2 \times 3^2 (= 36)$ $LCM = 2^4 \times 3^2 \times 5 \times 7 (= 5040)$	<p><b>C3</b></p> $2520 = 2^3 \times 3^2 \times 5 \times 7$ $3024 = 2^4 \times 3^3 \times 7$ $HCF = 2^3 \times 3^2 \times 7$ $LCM = 2^4 \times 3^3 \times 5 \times 7$	<p><b>C4</b></p> $740\ 880 = 2^4 \times 3^3 \times 5 \times 7^3$ $980\ 100 = 2^2 \times 3^4 \times 5^2 \times 11^2$ $HCF = 2^2 \times 3^3 \times 5 = 540$
<p><b>D1</b></p> $HCF, 18 = 2 \times 3^2$ $LCM, 540 = 2^2 \times 3^3 \times 5$ $90 = 2 \times 3^2 \times 5$ $x = \frac{2 \times 3^2 \times 2^2 \times 3^3 \times 5}{2 \times 3^2 \times 5} = 108$	<p><b>D2</b></p> $HCF, 6 = 2 \times 3$ $LCM, 180 = 2^2 \times 3^2 \times 5$ $12 = 2^2 \times 3$ $x = \frac{2 \times 3 \times 2^2 \times 3^2 \times 5}{2^2 \times 3} = 90$	<p><b>D3</b> Find two numbers between 100 and 150 that have a HCF of 22.</p> <p>They must both be multiples of 22, so</p> $5 \times 22 = 110$ $6 \times 22 = 132$	<p><b>D4</b></p> $360 = 2^4 \times 3^2 \times 5$ <p>Writing a list of the different factors gives...</p> <p>2, 4, 8, 3, 9, 5, 15, 45, 6, 12, 24, 18, 36, ...</p> <p>This gives lots of answers, such as</p> $15 + 36 + 45$