Common Mistakes & How to Avoid Them

Class X - Math

Chapter - Real Numbers

Types of Question	Common Mistakes	Points to be emphasised
(i) To prove a given number is irrational	(i) Skipping the steps of the proof. While proving $5\sqrt{7}$ to be irrational Writing that since $5\sqrt{7}$ is the product of 5 and $\sqrt{7}$ a rational and an irrational number and hence it is irrational. (ii) While making the assumption of given number to be rational not mentioning that p and q are co-prime integers. (iii) incorrect use of the result "If P is a **prime number** and it divides **a^2** then it divides **a** as well". For example in proving $\sqrt{6}$ to be irrational by contradiction we get $\sqrt{6} = \frac{p}{q}$ $\Rightarrow 6q^2 = p^2$ The conclusion 6 divides p^2 and hence divides p is wrong conclusion.	(i) When the question asks for proof Make sure that you write down all the steps of the proof starting with contrary assumption and then arriving at a contradiction and give the correct reasoning. Do not use properties and conclude. (iii)The result "If P is a **prime number** and it divides a^2 then it divides a as well." holds only in **case P is prime** So the conclusion 6 divides p^2 and hence divides p is wrong here as 6 is not a prime number it holds true in case of 2,3,5 …etc but not for 6. So the best way to prove $\sqrt{6}$ to be irrational is **to prove** that both $\sqrt{2}$ and $\sqrt{3}$ are irrational and hence the product of two irrationals is irrational. Remember **to prove** that both

		$\sqrt{2}$ and $\sqrt{3}$ are irrational. (iii) Practice the standard questions given in NCERT book and make sure that you write down the solution exactly in the same way as you will do in exams.
(ii) Finding HCF or LCM	(i) In the word problems students are not sure when to determine the LCM and when HCF. (ii) Not writing the final answer in case of word problems.	(i) Generally students have problem in interpreting the word problem. Look for what quantities to be determined, If the problem asks for maximum things, like Find the maximum numbers of rooms required, greatest size of a measuring can, etc then we need to find HCF, If the problem asks for simultaneous reoccurrence of events then it is LCM. (ii) Writing final answer is essential it has some marks allocated with it. For example in the problem Ram take 12 minutes to jog one round , while his friend takes 18 min. After covering how many rounds Ram'll meet his friend. Do not leave the answer at they will meet after 36 minutes. Also calculate the

	(iii) Not using the specified method for finding HCF (iv)Confusion in Euclid's division lemma and Algorithm applying Euclids division algorithm to find LCM (v) Wrong usage of the Rule Product of HCF and LCM = product of numbers	distance travelled by Ram is 36 min. (iii) If the method is specified then do not deviate from that , even if you feel more comfortable using Prime factorisation use Euclid's algorithm when it is specified. Similarly if the question is Find HCF of two numbers and hence find LCM Then find LCM using the relation HCF(a,b)×LCM((a,b) = a×b. (iv) Euclid's division lemma and Algorithm are closely linked with each other Algorithm is based on lemma and used for finding only HCF and not LCM (V) Product of HCF and LCM = product of numbers holds only for two numbers and not for three or more. i.e HCF(a,b,c)×LCM((a,b,c) ≠ a×b×c
(iii) Questions on identifying whether a given rational number is terminating or non terminating decimal	Students generally make mistake in identifying terminating decimals when either of the two prime numbers 2 or 5 is appearing in the prime factorisation	A number x = p/q is a terminating decimal if q $=2^n5^m$ where n,m are **non negative** integer So any of n and m can be a zero as well. So if q has either 2 or 5 or a combination of

		both as its prime factors p/q will terminate. If q = 2×7 or 5×7 then p/q will be non terminating and repeating
(iv) proof based on Questions on Euclid's division lemma	In the questions where we have to express a integer or its square and cube etc in the form of say 3m or 4m+1 etc students often does not know what are the integers to be taken for applying division lemma.	In such questions value of integers a and b depends on what needs to be proved. For example to prove any positive integer is either of the form 3m or 3m + 1 or 3m +2 we will apply division lemma to a and b =3