## Common mistakes & How to avoid
## X-Math

### Unit: GEOMETRY

| Chapter | Type of question | Common errors | Points to be careful about |
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| TRIANGLES | 1) Problems involving the Application of concept of similarity of triangles. | 1) Naming the triangles incorrectly.<br><br>2) Students get confused between congruent and similar triangles<br><br>3) Error in taking the corresponding sides of the similar triangles.<br><br>4)Error while writing the ratio of corresponding sides. | 1) When it is either given or you have proved  that $\triangle ABC \sim \triangle PQR$ Then take the correspondence of angles $\angle A = \angle P$ $\angle B = \angle Q$ , $\angle C = \angle R$<br><br>2) Congruent triangles are similar but not the other way i.e similar triangles may or may not be congruent. Any two equilateral triangles are similar but they will be congruent in case of equal side length. Never confuse similarity with congruence.<br><br>3) While taking ratios, if triangle, say ABC is taken in the numerator and PQR in denominator, then all corresponding aspects of ABC will be in numerator and of PQR will be in denominator.<br><br>For example: |

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| | | | $$\frac{\Delta ABC}{\Delta PQR} = \frac{area\,\Delta ABC}{area\,\Delta PQR} = \frac{AB}{PQ}$$ $$= \frac{AB^2}{PQ^2} \text{ and so on}$$ 4)For similar triangles $\Delta$ ABC $\sim$ $\Delta$ PQR Take the correspondence of angles $\angle$A = $\angle$P $\angle$B = $\angle$Q , $\angle$C = $\angle$R Then write the ratio of sides $$\left(\frac{AB}{PQ}\right) = \left(\frac{BC}{QR}\right) = \left(\frac{AC}{PR}\right)$$ |
| | 2) Theorems, their proofs and rider questions<br><br>For example: Basic Proportionality theorem.<br><br>Pythagoras theorem | 1) Not writing the Given and To prove information in the proofs of theorems asked.<br><br>2) The rider question (that is the question asked along with the proof of a theorem) is not answered using the theorem given in the question.<br><br>3) Error in writing the correct statement of the name theorems. | 1) Memorise the exact statement of all the name theorems like Basic Proportionality theorem and Pythagoras theorem, as they are asked in the exam for 1 or 2 marks.<br><br>2) While writing the proofs of the theorems, do not forget to write the Given and To prove statements as they carry some marks out of the total marks for the proof. Practice writing the proofs of all 5 theorems in the paper<br><br>3) The rider question (that is the question asked along with the proof of a theorem) should be answered using the theorem given in the same question even if it is |

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| | | 4) Not drawing the diagram in the question<br>5) Not writing reasons | solvable using some other concept and theorem. The best way to go about is search where you can apply the theorem in the question.<br><br>4) Always draw the diagram with the question<br>5) Mathematics is a science of reasoning every step must have a reason to support for example if in a triangle Two angles are equal and for the conclusion that the opposite sides are equal write the reason in brackets as sides opposite to equal angles are equal. |
| | 3) Application Problems | Not able to comprehend the problem and hence write the proof. | 1)In order to tackle problems which requires proof first of all write down the given information and see what all can be inferred from that , afterwards write the to prove information draw the diagram then strategise using which known theorem/ result we can reach the solution that way even if we are not able to prove the result some marks we will get for all the information provided.<br><br>2) Keep in mind the results or properties |

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| | | | about triangles and angles etc done in previous chapters/classes since they are used. |
| CIRCLES | 1) Proofs of theorems on tangents.<br><br>2) A 1 marker or 2 marker rider or independent question on finding the length of tangent or radius or proving some result. | 1) Beginning the solution with proof skipping given etc, Not giving reasons<br><br>2) Students are generally not able to start with the proof or solution. | 1) Practice writing the proofs of both the theorems in the chapter thoroughly as they are asked in the exam.<br><br>2) Before attempting an answer, make sure you understand the question completely because then only you will be able to decide the right strategy to solve it. Draw the diagram<br><br>3) See the question carefully and find out that the hypothesis of which theorem is satisfied so as to apply the correct theorem. |
| CONSTRUCTIONS | 1) Construction of similar figures<br><br>2) Construction of tangents to a circle from external point. | 1) Students tend to take approximations in the construction which leads to incorrect figure.<br><br>2) Using a protractor to draw the required angles. Or not using the compass etc<br><br>4) An untidy | 1) While constructing a tangent, be careful while drawing the arcs. If the arcs are not drawn accurately, you don't get the correct angles and the purpose is defeated.<br><br>2) Drawing a rough sketch before drawing the actual figure helps.<br><br>3) Angles should be constructed with the help of a compass and not protractor (D) unless the angle is of a measurement say $50^\circ$ |

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| | | figure is made with a blunt pencil and no neatness. | 4) Steps of construction should be written only if asked or according to the questions weight-age.<br><br>5) The figure should be neatly and accurately drawn, using sharpened pencil and appropriate instruments like ruler and compass. There are marks for accuracy. |
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