**IB Math HL1: IB Questions**

**Limit using l'Hopital's rule and Improper Integral**

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| 4 | **Homogeneous Differential Equations:** |
|  | 1. a) A homogeneous differential equation has the form  Show that the substitution . Given that  leads to a differential equation which can be solved by separation of variables.  b) Show that the linear change of variables , , transforms the equation  to a homogeneous form. Hence solve the equation.  2. Solve the differential equation, . Given that  when .  3. Solve the differential equation  , given  when. Give your answer in the form .  4. Solve the differential equation, , where the domain is  , and given  when . Give your answer in the form .  5. Solve the differential equation, , given  when. Give your answer in the form .  6. |
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