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|  | Homework | 11th July 2023 |

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1. Let

Prove:

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Integrating both sides from , we get,

Multiplying both sides by , we get,

Integrating both sides from , we get,

Consider only the cases when , then the function and has exactly complete oscillations in the interval of integration, . When we integrate this function, the result is zero (because we are integrating over an integer (greater than or equal to one) number of oscillations). This simplifies our result to

Since cosine is an even function  is time varying and has exactly  complete oscillations in the interval of integration, except when  in which case  so

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**Solve the following**:

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