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Question 1:

- (a) FEA can be used to make the design process more efficient, including reducing the number of physical prototypes used in the testing phase. Instead of building physical prototypes, virtual prototypes can be created and analysed. This can significantly reduce the time and the expense of building prototypes. FEA can be used to assess the performance of a prototype with incurring the cost associated with creating a manufacturable CAD model. For the purpose of FEA and testing, it may be possible to ~~simplify~~ simplify the model by removing features such as bosses and fillets. If these will not affect the results of the FEA, the features will only hinder the run time for the calculations. Furthermore, using FEA can help to improve relations with customers as the cost and performance of the component can be realised much sooner in the design process. This can help assure the customer that the component they receive will be of high quality and fit for purpose. In addition to this, some complex components may require very specific tooling or equipment for manufacturing. In this instance, both time and investment has been saved by allowing analysis to be completed using virtual prototypes rather than physical ones. Finally, using FEA to reduce the number of prototypes is achievable