機械工程實驗(二)期末考術科測驗_答案卷

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考試日期：2024.05.20 (19:30 - 21:30)

總分:100 分

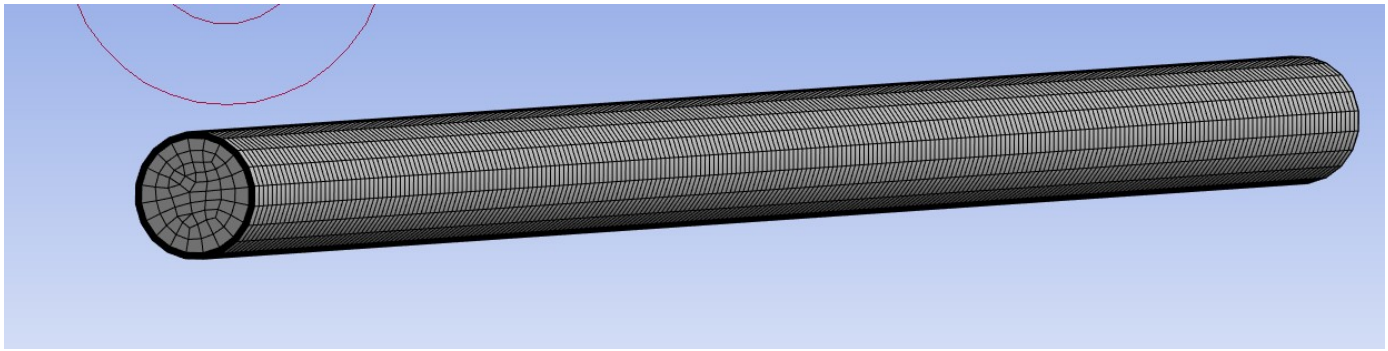
學號：　　姓名：

90

1. 請附上”velocity inlet”的網格分佈及”Detail of Inflation”截圖 (10%)

Details of "Inflation" - Inflation

Scope	
Scoping Method	Geometry Selection
Geometry	1 Face
Definition	
Suppressed	No
Boundary Scoping Method	Geometry Selection
Boundary	1 Edge
Inflation Option	First Layer Thickness
First Layer Height	1.5e-002 mm
Maximum Layers	20
Growth Rate	1.05
Inflation Algorithm	Pre

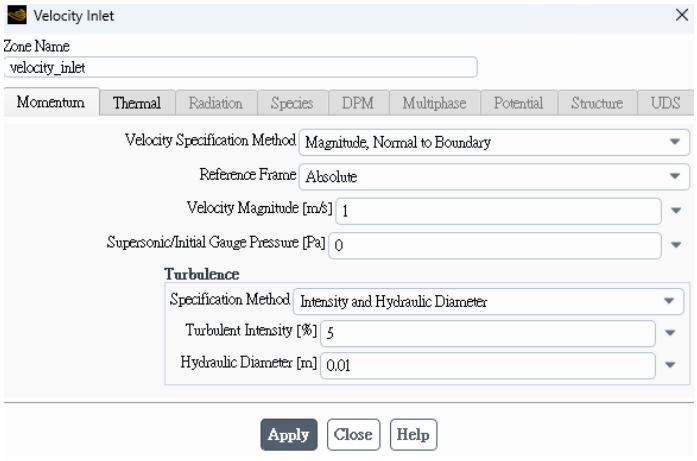


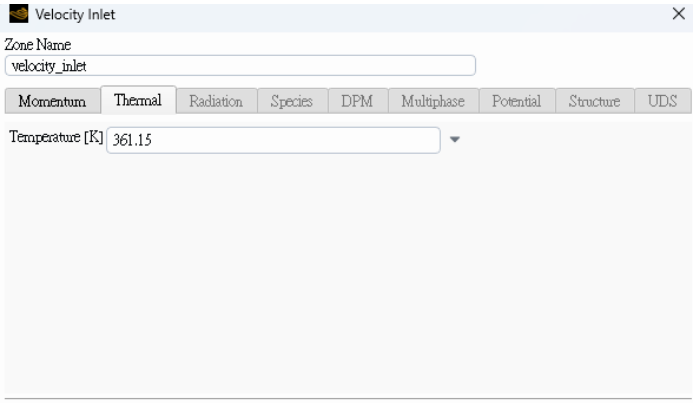
2. 請附上 Detail of Mesh 中，”Statistics”截圖 (10%)

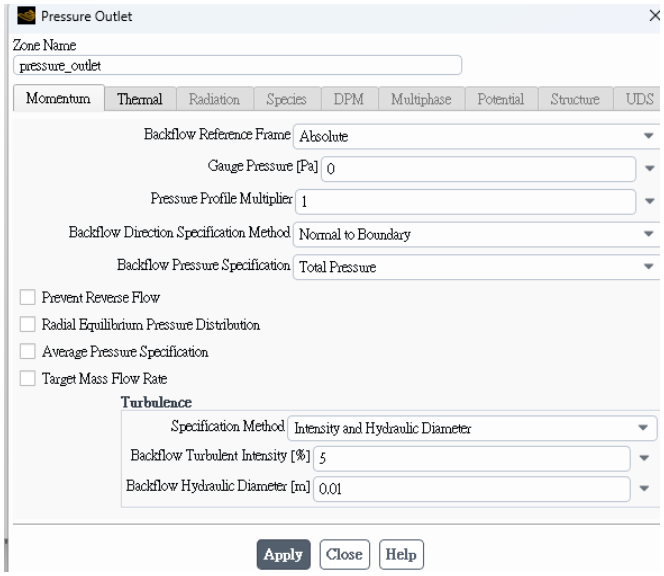
Details of "Mesh"

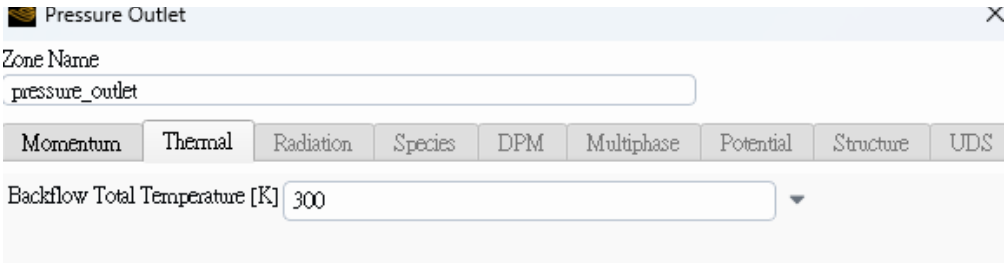
Display	
Display Style	Use Geometry Setting
Defaults	
Physics Preference	CFD
Solver Preference	Fluent
Element Order	Linear
Element Size	Default (12.52 mm)
Export Format	Standard
Export Preview Surface Mesh	No
Sizing	
Quality	
Inflation	
Advanced	
Statistics	
Nodes	118472
Elements	115750
Show Detailed Statistics	No

3. 請附上” Velocity Inlet” & “outlet”的 momentum & Thermal 邊界條件設定截圖 (10%)

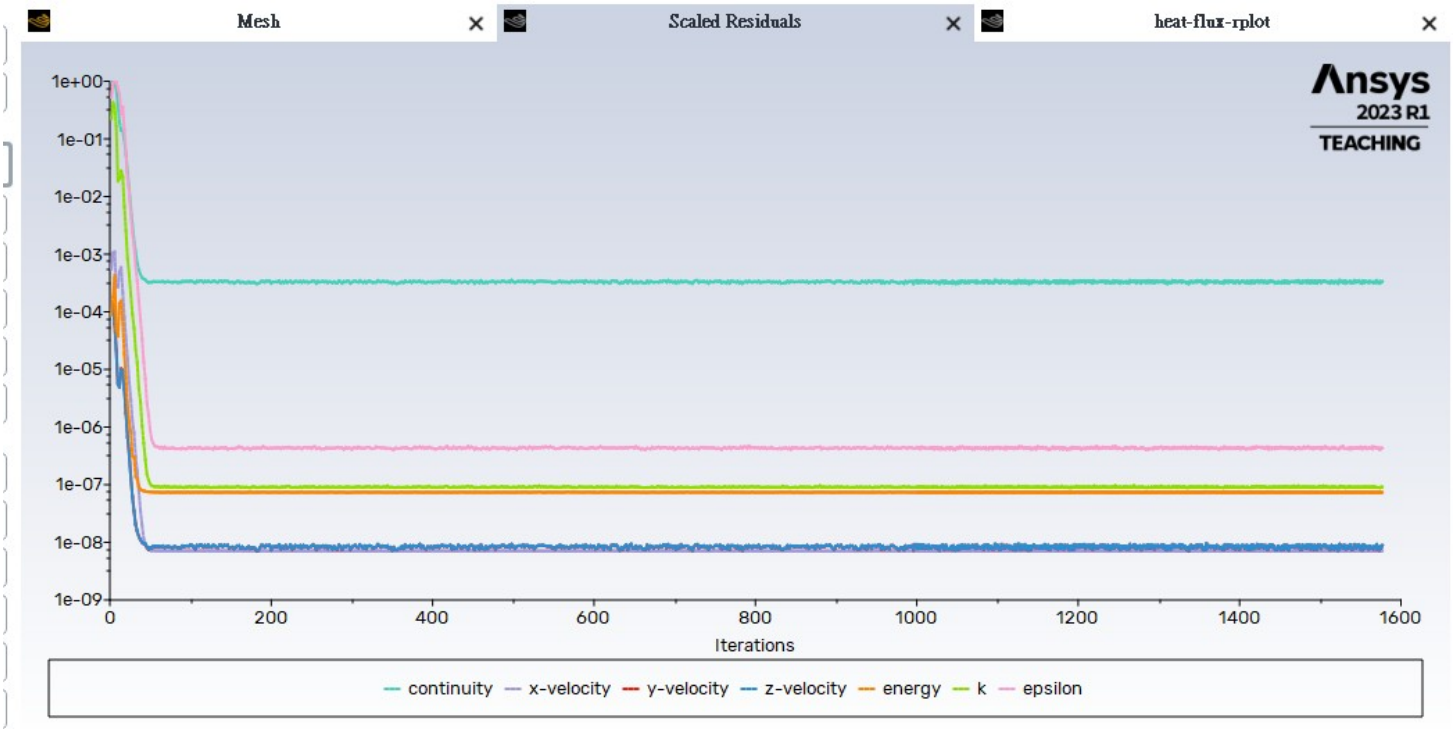




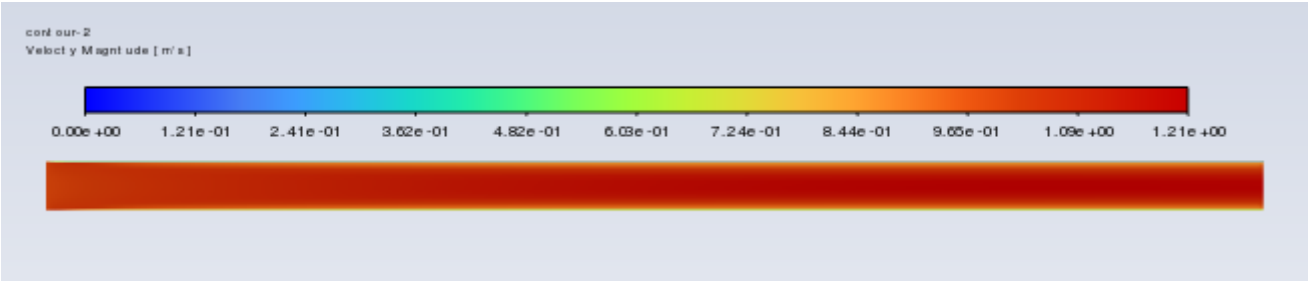


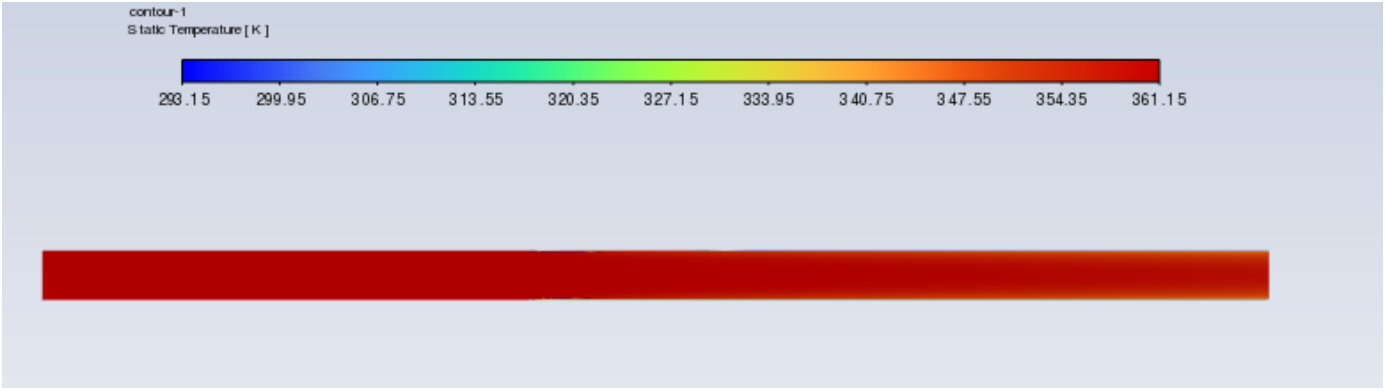


4. 請附上”Residuals”和計算 cooling wall heat flux 數值截圖 (10%)

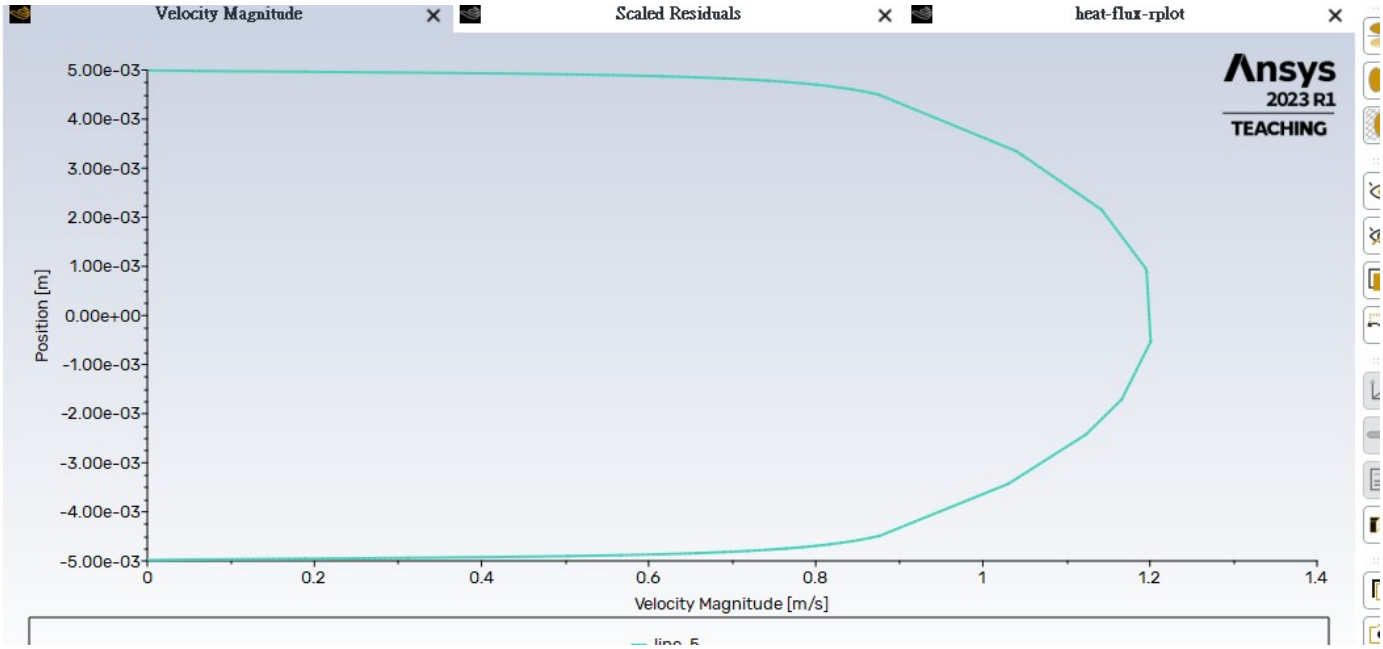


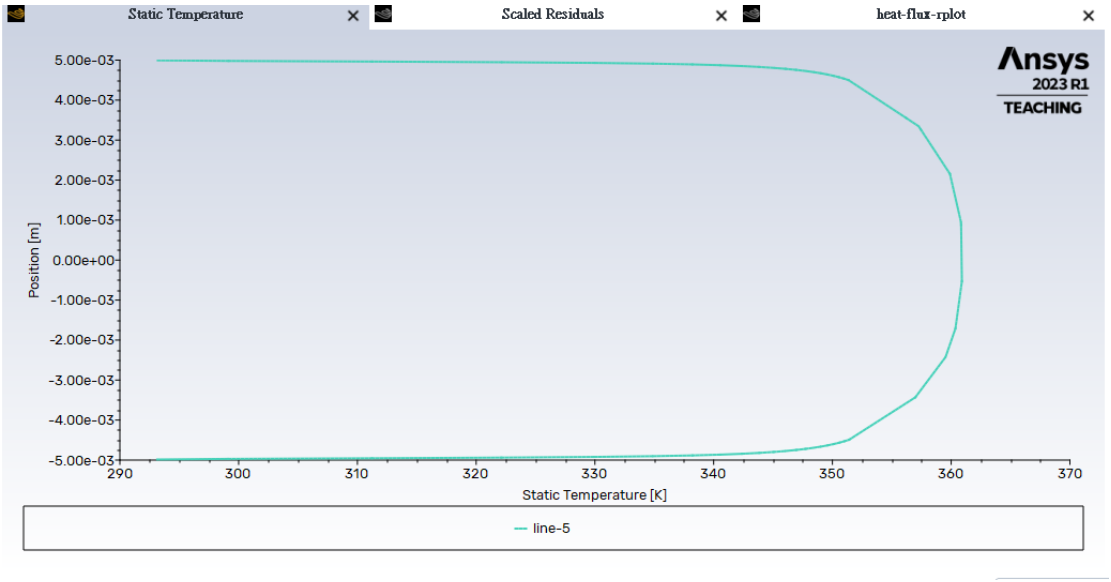
5. 依據圖二的平面條件，畫出圓管剖面的速度&溫度分布圖 (Contour) (10%)





6. 依據圖三的基準線，畫出圓管的速度&溫度曲線圖 (XY Plot) (10%)





7. 請說明邊界層厚度的定義 (10%)

速度邊界層厚度=u/u_free_stream=0.99 處

8. 請說明在模擬圓管時，在主要分析區域前，預設外加一段圓管與流場發展的關係? (10%)

在主要分析區域前，預設外加一段圓管越長，則能確保到主要分析區域時，不受 tube inlet 的初始擾動影響，

9.請說明網格獨立性測試之必要性? (20%)

測試網格大小的取用大小，和最終計算結果的關係，以確保計算結果的獨立性(計算結果不受網格大小影響)