Pipe Sizing Comparison Homework Assignment

The following examples are taken from the module 3 discussions (with slight modifications so you have to solve for D). For each of these three examples, solve for the pipe diameter, and then select the commercial pipe size. Then solve the same problem using the other two methods (making appropriate estimates for the comparable material roughness. Therefore, you will have 3 solutions for each problem, for a total of 9 calculations. Discuss why the answers may be different, and discuss under which conditions why one method should be used in preference to the others:

Darcy Weisbach:
Determine the diameter for:
$Q = 0.24$ m^3/sec
Commercial steel
$L = 200$ m
Allowable head loss 3.5 m

Hazen Willimans:
Determine the diameter for:
$Q = 0.25$ m3/sec
$C = 130$
$L = 1,000$ m
Allowable head loss 2.9 m

Manning Equation:
Determine the diameter for:
Concrete pipe
$V = 1.0$ m/sec
$L = 30$ m
Allowable head loss 0.054m