Independent Contract Plumbers

You work for a company named Independent Contract Plumbers (ICP). This company has recently been awarded a large contract. You have been named to a select committee to study certain aspects of the project. You are to discuss with your group how the following components affect the project and what effects changing these components will have. You are to take into consideration: water pump power (V), water flow through the pipes (I), and pipe size (R).

The water pump will pump water through the system.

1. Increasing the power of the pump will have what effect on water flow? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Decreasing the power of the pump will have what effect on water flow? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. What type of relationship is between pump power and water flow? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Decreasing pipe diameter will have the effect of increasing resistance to water flow; increasing pipe diameter will have the effect of decreasing water flow.

4. What will happen to water flow if I increase the resistance? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. What will happen to water flow if I decrease the resistance? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. What type of relationship is between resistance and water flow? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Put into a mathematical equation the relationship between water flow, pump power, and resistance to flow. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Can you manipulate this formula so that you can solve for pump power and resistance to flow given water flow? Write them down. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. What would happen if you added another piece of pipe in series (end-to-end) to the original pipe? What would happen to total resistance? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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10. What would happen to water flow if you added a smaller diameter pipe (increased the resistance to flow)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Do you think it would make any difference on total water flow if the new, smaller pipe was added before or after the original piece of pipe? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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12. What would happen to water flow if you added a smaller diameter pipe to the system in parallel (created an additional route for the water to flow)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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13. What do you think would happen to water flow if you added a whole bunch of smaller diameter pipes to the system in parallel (created a lot of additional routes for the water to flow? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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