

FirePumpSim Printable Scenario

Page 1 of 2

Driver/Operator Practice Worksheet

Scenario: Industrial Building Fire - Portable Monitor Operation

Student Name: _____

Date: _____

Class: _____

Score: _____

Given / Reference

- Apparatus: Engine 181; hydrant supply established
- Portable monitor total flow: 500 GPM through two identical supply lines
- Each supply line: 200 ft of 2 1/2-inch hose; hose coefficient (C): 2
- Monitor nozzle pressure: 80 PSI; appliance loss: 10 PSI
- Elevation change: 0 PSI

Student Questions

1. The portable monitor flows 500 GPM through two identical supply lines. How many GPM is each line carrying?

2. Using $FL = C \times Q^2 \times L$, what is the friction loss in each 200-foot 2 1/2-inch supply line?

3. What PDP is required to supply the portable monitor?

4. If both supply lines were 250 ft long instead of 200 ft, what would the friction loss in each line be?

5. If both supply lines were 250 ft long, what would the new PDP be?

Required Equations

• Flow per equal line = Total GPM / Number of lines

• $FL = C \times Q^2 \times L$

• $Q = GPM / 100$

• $PDP = NP + FL + \text{Appliance Loss} \pm \text{Elevation}$

Training use only. Follow department SOPs, instructor direction, and local hydraulic guidance.

FirePumpSim Answer Key

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Instructor Answer Key

1. Flow in each supply line

500 GPM / 2 equal lines = **250 GPM per line.**

2. Friction loss in each 200-ft line

$Q = 250 / 100 = 2.5$; $L = 200 / 100 = 2$.
 $FL = 2 \times (2.5)^2 \times 2 = \mathbf{25 \text{ PSI.}}$

3. Required monitor PDP

$PDP = 80 \text{ NP} + 25 \text{ FL} + 10 \text{ appliance} + 0 \text{ elevation.}$
Answer: 115 PSI.

4. Friction loss with 250-ft lines

$L = 250 / 100 = 2.5$.
 $FL = 2 \times (2.5)^2 \times 2.5 = 31.25 \text{ PSI.}$
Rounded answer: 31 PSI.

5. New PDP with 250-ft lines

$PDP = 80 + 31 + 10 = \mathbf{121 \text{ PSI.}}$

Accept reasonable rounding unless the instructor specifies otherwise.