

FirePumpSim Printable Scenario

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Driver/Operator Practice Worksheet

Scenario: Apartment Fire - Single Attack Line

Student Name: _____

Date: _____

Class: _____

Score: _____

Given / Reference

- Apparatus: Engine 181; hydrant supply established
- Attack line: 200 ft of 1 3/4-inch hose to a second-floor apartment entrance
- Nozzle: Fog nozzle, 150 GPM at 100 PSI
- Hose coefficient (C): 15.5
- Elevation gain: 10 ft (add 5 PSI); appliance loss: 0 PSI

Student Questions

1. Using $FL = C \times Q^2 \times L$, what is the friction loss in the 200-foot 1 3/4-inch attack line?

2. What pump discharge pressure (PDP) is required to supply this line to the second-floor apartment entrance?

3. If a second identical 200-foot line with the same nozzle is stretched to a first-floor apartment entrance, what is the total fire flow?

4. If both lines are flowing, what friction loss would each 200-foot line have?

5. What PDP is required for the first-floor line described in Question 3?

Required Equations

• $FL = C \times Q^2 \times L$

• $Q = \text{GPM} / 100$

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

• Elevation pressure = 0.5 PSI per vertical foot

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

FirePumpSim Answer Key

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Instructor Answer Key

1. Friction loss in the attack line

$$Q = 150 / 100 = 1.5; L = 200 / 100 = 2.$$

$$FL = 15.5 \times (1.5)^2 \times 2 = 69.75 \text{ PSI.}$$

Rounded answer: 70 PSI.

2. Required PDP to the second floor

$$PDP = 100 \text{ NP} + 70 \text{ FL} + 0 \text{ appliance} + 5 \text{ elevation.}$$

Answer: 175 PSI.

3. Total fire flow with two lines

$$150 \text{ GPM} + 150 \text{ GPM} = \mathbf{300 \text{ GPM total.}}$$

4. Friction loss in each line

Each line still carries 150 GPM through 200 ft of 1 3/4-inch hose.

Answer: 70 PSI in each line.

5. Required PDP for the first-floor line

No elevation pressure is added: $100 \text{ NP} + 70 \text{ FL} = \mathbf{170 \text{ PSI.}}$

Accept reasonable rounding unless the instructor specifies otherwise.