

# FirePumpSim Printable Scenario

Page 1 of 2

## Driver/Operator Practice Worksheet

### Scenario: Rural Water Supply - Tanker Shuttle House Fire

Student Name: \_\_\_\_\_

Date: \_\_\_\_\_

Class: \_\_\_\_\_

Score: \_\_\_\_\_

#### Given / Reference

- Engine 181 drafts from a 2,000-gallon portable tank during a house fire
- Current attack line: 200 ft of 1 3/4-inch hose, flowing 150 GPM at 100 PSI
- Hose coefficient (C): 15.5; appliance loss: 0 PSI; elevation change: 0 PSI
- A second line may be added: 150 ft of 2 1/2-inch hose (C = 2), 200 GPM at 100 PSI
- Use the portable tank volume for water-duration calculations

#### Student Questions

1. What is the friction loss in the 200-foot 1 3/4-inch attack line?

\_\_\_\_\_

2. What PDP is required to supply the current attack line?

\_\_\_\_\_

3. What PDP is required for the possible 150-ft 2 1/2-inch, 200-GPM second line?

\_\_\_\_\_

4. If only the 150-GPM attack line is flowing, approximately how many minutes of water are available from the 2,000-gallon tank?

\_\_\_\_\_

5. If both lines flow for 5 minutes before the next tender arrives, how many gallons remain in the portable tank?

\_\_\_\_\_

#### Required Equations

•  $FL = C \times Q^2 \times L$

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

•  $\text{Remaining water} = \text{Tank gallons} - (\text{Total GPM} \times \text{Minutes})$

•  $Q = \text{GPM} / 100$

•  $\text{Water duration} = \text{Tank gallons} / \text{Total GPM}$

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

# FirePumpSim Answer Key

## Driver/Operator Practice Worksheet

### Scenario: Rural Water Supply - Tanker Shuttle House Fire

Student Name: \_\_\_\_\_

Date: \_\_\_\_\_

Class: \_\_\_\_\_

Score: \_\_\_\_\_

#### Scenario Givens

- Engine 181 drafts from a 2,000-gallon portable tank during a house fire
- Current attack line: 200 ft of 1 3/4-inch hose, flowing 150 GPM at 100 PSI
- Hose coefficient (C): 15.5; appliance loss: 0 PSI; elevation change: 0 PSI
- A second line may be added: 150 ft of 2 1/2-inch hose (C = 2), 200 GPM at 100 PSI
- Use the portable tank volume for water-duration calculations

#### Instructor Answer Key

##### 1. Current attack-line friction loss

$Q = 1.5$ ;  $L = 2$ .

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

**Rounded answer: 70 PSI.**

##### 2. Current attack-line PDP

$PDP = 100 \text{ NP} + 70 \text{ FL} = 170 \text{ PSI}$ .

##### 3. Second-line PDP

$Q = 2$ ;  $L = 1.5$ .

$FL = 2 \times (2)^2 \times 1.5 = 12 \text{ PSI}$ .

$PDP = 100 + 12 = 112 \text{ PSI}$ .

##### 4. Water duration with one line

$2,000 \text{ gallons} / 150 \text{ GPM} = 13.33 \text{ minutes}$ .

**Rounded answer: 13.3 minutes.**

##### 5. Water remaining after 5 minutes

Total flow =  $150 + 200 = 350 \text{ GPM}$ .

Water used =  $350 \times 5 = 1,750 \text{ gallons}$ .

Remaining =  $2,000 - 1,750 = 250 \text{ gallons}$ .

*Accept reasonable rounding unless the instructor specifies otherwise.*