

### Flow Rates

Flow rates describe the speed at which water is flowing. They are described in gallons per minute (gpm). The following test is a simple way to observe a flow rate.

Use a large drum with a marked level to indicate a pre-measured 50-gallon volume. Begin filling the drum with a hose and at the instant that the water begins to fill the tank, start timing how long it takes with a precise stop watch (preferably to 1/100 of a minute). When the water level reaches the marked line, take the hose away, and stop timing. To calculate the flow rate of the water through the hose, divide the total volume by the total time it took to reach that volume. Suppose it took 3.55 minutes.

50 gallons per 3.55 minutes (50/3.55)

$50 \div 3.55 = 14.08$

Flow rate = 14.08 gpm

If the stop watch has only seconds and minutes, the seconds can be converted into fractions (parts) of minutes. There are 60 seconds in 1 minute.

### Practice

1. If it took 3 minutes and 40 seconds to fill a 100-gallon bucket, what was the flow rate?

- 29 gpm
- 27 gpm
- 22 gpm
- 0.34 gpm

Select the correct answer.

2. An engine operator notices that 40% of the tank water has been used in 1 hour. At that rate, how long will it take to empty the tank?

1.5 hours

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- 2.5 hours
- 1 hour
- 0.75 hours

Select the correct answer.

3. A 1200 gallon portable tank is set up to supply two pumps that are pumping two hose lays at a total use-rate of 30 gallons per minute. How many 2000 gallon water tenders will it take to keep the tank filled if the fill-and-return time is one hour?

- Two
- Three
- One
- None, the portable tank is too small.

Select the correct answer.