



## OPERATOR MATH PDH WORKBOOK

Completion of this workbook will count for 1 PDH

Arizona Department of Environmental Quality  
Drinking Water Section-Programs Unit  
Operator Certification Program  
1110 West Washington Street  
Phoenix, AZ 85007  
[www.azdeq.gov](http://www.azdeq.gov)

NAME\_\_\_\_\_

OPCERT NUMBER OP0\_\_\_\_\_

DATE\_\_\_\_\_

## DIRECTIONS

Answer the questions in the space provided with concise and accurate answers. Mail the completed booklet along with your renewal form at the time of renewal to the address provided. It is recommended that you keep a copy of the completed booklet for your records. Completion of this workbook will earn the operator one (1) PDH. Please print clearly. Workbooks that are illegible will not receive PDHs.

PDH means professional development hour.

A professional development hour is equal to one contact hour of continuing education. A total of 30 professional development hours are required for each 3-year renewal period regardless of the number of certificates that are held by an individual operator. Ten of the thirty PDHs must be directly related to an operator's job.

The type of PDH acceptable to the Department for certificate renewal include, but are not limited to: an approved college course, a course offered by a Certified Environmental Trainer, regulatory and tribal agency training, certain types of in-house training, technical conferences, correspondence courses, and manufacturer product training. An accredited college course is usually recorded in credit hours. In general, 1 college credit hour = 10 PDHs. If an operator has a question about a specific type of training, please contact the Operator Certification Coordinator for approval before attending the training.

## FOR MORE INFORMATION, CONTACT:

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**Show the math steps taken to reach your answer.** Math conversion sheet can be downloaded at [http://www.abccert.org/testing\\_services/certification\\_study\\_resources.asp](http://www.abccert.org/testing_services/certification_study_resources.asp)

1. A new manhole is going in and you have to remove a circle of asphalt 40 feet in diameter. How many square feet of asphalt are being removed?

2. If the asphalt in the problem above is 10 inches thick, how many cubic feet of asphalt is being removed?

3. What is the percent grade on a 2 feet rise in 300 feet?

4. How many hours is 67.64 minutes?

**5.** What is the square footage of a rectangular clarifier 80 feet long, 40 feet wide and 10 feet deep?

**6.** If 8,500 lbs/day of solids with a volatile solids content of 70% are sent to the digester, how many lbs/day volatile solids are sent to the digester?

7. A 60 foot aerobic digester has a side water depth of 10 feet. The sludge flow to the digester is 8500 gpd. Calculate the detention time in days.

8. A basin has a length of 52 feet and a width of 13 feet. Calculate the area in square feet.

9. Calculate the volume in cubic feet of a tank that measures 12 feet by 13 feet by 9 feet.

10. A water main is 10" in diameter and has a length of 5,000 feet. How many million gallons of water will it hold?

**11.** What is 5% of a 1.2 MG tank?

**12.** The flow through a pipe is 2.6 cfs. What is the flow in gpm?



**13.** If a 2,200 gallon tank is full of water how many pounds of water is in the tank?

**14.** A cork is placed in a channel and travels 370 feet in 2 minutes. What is the velocity of the wastewater in the channel, ft/min?.

**15.** A sewer has failed and 81 feet of 12-inch pipe must be replaced. Replacement pipe comes in 10 foot sections. How many 10 foot sections will be required?

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For additional training/PHDs click on the link below. This course provides 16 hours of PDH-approved training for drinking-water operators in the State of Arizona. These are available as individual lessons for credit or as a whole course.

<http://www.waterhelp.org/index.php/client/arizona>