

**WUS 050 Water Math and Hydraulics
Half way point test**

October 13, 2010

Name: _____

(2-points each)

1. Divide $7/16$ by $1/3 =$

- a. $1 \frac{1}{2}$
- b. $1 \frac{3}{8}$
- c. $1 \frac{1}{4}$
- d. $1 \frac{5}{16}$

2. Add $16 \frac{5}{7}$ to $11 \frac{2}{5} =$

- a. $29 \frac{14}{35}$
- b. $28 \frac{8}{35}$
- c. $29 \frac{4}{35}$
- d. $28 \frac{8}{17}$

3. Subtract $3/8$ from $1 \frac{11}{32} =$

- a. $11/32$
- b. $15/32$
- c. $11/28$
- d. $31/32$

4. 48.6 is 39.3% of what number?

- a. 123.7
- b. 19.1
- c. 138.7
- d. 149.96

5. 0.23% of 7.8 = _____

- a. 0.9
- b. 0.55
- c. 0.02
- d. 33.9

6. A utility truck weighs 2.5 tons and filled up with 37.6-gallons of diesel fuel at a cost of \$132.30 after driving for 441 miles. Determine the fuel cost per mile.

- a. \$0.58/mile
- b. \$11.73/mile
- c. \$0.30/mile
- d. \$2.80/mile

(5-points each)

7. A treatment plant had a flow of 1 mgd and desired to maintain a chlorine residual of 5 ppm. Determine the amount of pounds fed per day of 100% chlorine gas.
- 8.34 lbs/day
 - 16.68 lbs/day
 - 41.7 lbs/day
 - 417 lbs/day
8. Find the area of a circle whose diameter is 1.5-feet.
- 1.8 sq. feet
 - 1.2-sq.ft.
 - 3.8-sq.ft
 - 19.2-sq.ft
9. Determine the amount of cubic feet of water in a pipe that has a 12-in I.D. and 1,665-feet long.
- 1,099 cubic feet
 - 8,220.52 cubic feet
 - 158,256 cubic feet
 - 1,307 cubic feet
10. $(17.2)^3 =$
- 4,049.6
 - 2,788.75
 - 3,987.23
 - 5,088.4
11. 37.32 inches = _____ feet
- 6.47
 - 3.11
 - 4.96
 - 23 97
12. $864 \text{ In}^2 =$ _____ Ft^2
- 8
 - 17.6
 - 6
 - 14

13. A pressure gauge reads 10.6 psi. The diameter of a tank is 43-feet. Determine the amount of cubic feet of water in the tank.
- 31,229
 - 59,784
 - 35,008
 - 35,530
14. Find the area of a circle that has an inside diameter of 8.7-feet.
Area=0.785D²
- 9.4 square feet
 - 59.4 ft²
 - 37.54 ft²
 - 50.17 square feet
15. 7/8 of a cubic foot of water weighs? _____ Lbs
- 62.4 lbs
 - 8.34 lbs
 - 54.6 lbs
 - 287.2 lbs
16. 47 inches per second equals how many miles per hour?
- $$\frac{47 \text{ in}}{\text{Sec}} \times \frac{60 \text{ sec}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{\text{ft}}{12 \text{ in}} \times \frac{\text{mile}}{5280 \text{ ft}} =$$
- 2.99 mph
 - 1.99 mph
 - 2.67 mph
 - 26.7 mph
17. Convert 23.9 cubic feet per second to million gallons per day
- $$\frac{23.9 \text{ft}^3}{\text{Second}} \times \text{_____} = \text{_____ mgd}$$
- 15.4 mgd
 - 14.3 mgd
 - 36.99 mgd
 - 3.7 mgd

18. How many gallons of water can a pipeline with a circumference of 18.7-feet, and 1575 feet long hold when full? ($C=\pi D$)
 $(V=0.785D^2 \times L \times 7.48 \text{ gal/ft}^3)$ $\text{Pi} = 3.1416$

- a. 493,950 gal
- b. 300,965 gal
- c. 240,923 gal
- d. 357,400 gal

19. If the water velocity were 4.7 feet per second and the cross-sectional area of a pipe were 15.9 ft², then calculate the Q or cubic feet per second, cfs. ($Q = AV$)

- a. 9.85 cfs
- b. 44.3 cfs
- c. 75 cfs
- d. 88.7 second feet

20. If the flow were 24.3 cfs and the inside area of a pipe were 12.1 ft², what is the velocity of the water in the pipe? ($V = Q/A$)

- a. 2 ft/sec
- b. 3 ft/sec
- c. 5 ft/sec
- d. 10 ft/sec

Extra credit 3-points each

21. Find the inches per minute rise rate when a filter had a backwash rate of 22-gpm/sq.ft.

- a. 35.2 in/min
- b. 28.1 in/min
- c. 15.8 in/min
- d. 13.8 in/min
- e. None of the above

22. Determine the Unit Filter Run Volume (UFRV) in gallons per square foot when a 1,300 sq.ft. filter produced 11.8 million gallons during its run.

- a. 5,077
- b. 8,105
- c. 9,077
- d. 11,080