MATH TEST QUESTIONS

1. You need to buy pipes that total 333 metres in length. All you can find at the store are pipes that are 50 metres long. How many pipes do you need to buy?
   a. 7
   b. 6
   c. 10
   d. 1

2. Water is flowing from a reservoir at a rate of 18,500 L/hour from a reservoir. How much water is flowing out in m^3/hour?
   a. 18,500
   b. 180,500
   c. 18.5
   d. 25

3. A ferric chloride pump is calibrated to delivery 475 mL in 20 seconds. How much coagulant is being added in L/min?
   a. 1.425
   b. 14.25
   c. 0.1425
   d. 0.7125

4. In 1996, there were 3,927 residents in your municipality. In 2015 there were 15,305. How many more residents were there in 2015?
   a. 3,772
   b. 10, 308
   c. 11,378
   d. 5,378

5. The hardness of the source water is 350 mg/L and the ion exchange water softening plant desires a finished water hardness of 120 mg/L. What is the difference in hardness?
   a. 130 mg/L
   b. 230 mg/L
   c. 530 mg/L
   d. 220 mg/L

6. If you convert 0.53 m^3/s to L/min, the correct answer is:
   a. 381,000 L/min
   b. 0.38 L/min
   c. 53 L/min
   d. 31,800 L/min

7. If a water tank holds 15,500 L of water and 3,503 L get used up on the first day, and 4,509 L get used on the second day, how much water is left in the tank?
   a. 7,488 L
   b. 6,488 L
   c. 11,997 L
   d. 10,991 L

MATH TEST QUESTIONS

8. If, on average, the residents consume a total of 1,080,000 L of water per day, how many litres will be consumed in two weeks?
   a. 10,120,150 L
   b. 15,120,000 L
   c. 1,512,000 L
   d. 100,053,000 L

9. The maximum flow rate of a chemical feed pump is 275 mL/min. How many mL would be pumped in 24 hours?
   a. 16,500 mL
   b. 396,000 mL
   c. 275,000 mL
   d. 5,396,000 mL

10. If the Livingstone Wastewater Treatment Facility spends 53% of its budget on salaries, and the budget is $1,270,000, how much is spent on salaries?
    a. $573,000
    b. $326,000
    c. $673,100
    d. $67,300

11. Wastewater flows through a pipe at a rate of 5,000 L/min. If the flow is obstructed by 36%, what would the resulting flow be?
    a. 3,200 L
    b. 5,100 L
    c. 3,600L
    d. 1,800 L

12. If a reservoir has its overflow 18 m above the bottom and there is 6 m of water in the reservoir, what percentage of its maximum capacity is the reservoir filled?
    a. 66%
    b. 90%
    c. 33%
    d. 25%

13. If a water meter is tested and found to read 23,503 L, but the actual usage was 31,337 L, what is the accuracy of the meter as a percentage?
    a. 99%
    b. 75%
    c. 35%
    d. 66%

14. If a tank contains 100 m^3 of water, and the tank has a capacity of 1000 m^3, what percent of the tank is filled?
    a. 10%
    b. 20%
    c. 1%
    d. 50%

MATH TEST QUESTIONS

15. What is the area, in m², of a storage shed that has the dimensions 75 m length, 37.5 m width, and 10 m height?
    a. 28,125
    b. 750
    c. 375
    d. 2812.5

16. The volume of a cylindrical tank that has a diameter of 6m and a height of 12 m, is:
    a. 339.4 m³
    b. 226.28 m³
    c. 2,489 m³
    d. 36 m³

17. What is the circumference of a pipe that has a diameter of 30 cm?
    a. 188.57 cm
    b. 942.8 cm
    c. 60 cm
    d. 94.28 cm

18. The bottom part of a water storage tank is cone-shaped. If the diameter is 50 m and the height is 3 m, the volume of the cone-shaped part is:
    a. 1,414.28 m³
    b. 7,857.14 m³
    c. 1,964.28 m³
    d. 1,500.25 m³

19. The cross section area of a pipe with a diameter of 30 cm is:
    a. 707.14 cm²
    b. 2,828,57 cm²
    c. 835.67 cm²
    d. 900.03 cm²

20. The maximum flow rate of a chemical feed pump is 275 mL/min. if the pump ran continuously at this rate for 24 hours, the number of Litres that would be pumped is:
    a. 396
    b. 39.6
    c. 275
    d. 6.6

21. A line has failed and 77.5 m of 200 mm pipe must be replaced. How many 1.5 m sections of pipe will be needed?
    a. 15 sections
    b. 20 sections
    c. 52 sections
    d. 40 sections

MATH TEST QUESTIONS

22. The water level in an elevated tank is 10 m above the ground. The resulting pressure at a tap on line at ground level is:
    a. 103.4 kPa
    b. 224.1 kPa
    c. 98 kPa
    d. 74.7 kPa

23. A flow meter reads 6,678.6 m^3 on one Monday, and 7,399.6 m^3 on the following Monday. What is the average daily flow?
    a. 51,500 L/day
    b. 103,000 L/day
    c. 183,000 L/day
    d. 206,000 L/day

24. Over the course of four years, the hour meter on a pump had the following readings at the end of each year:

Year	Reading
1	976.3
2	1,325.8
3	2,007.1
4	2,371.4

How many hours did the pump run during the fourth year?
    a. 349.5 hours
    b. 364.3 hours
    c. 681.3 hours
    d. 830.2 hours

25. How long will it take to fill an empty tank that is 6 m wide, 12 m long, and 9 m deep with a pump that delivers water at 15 L/second:
    a. 8 hours
    b. 3 hours
    c. 12 hours
    d. 9 hours

26. What is the volume of a 20 cm pipe that is 600 m long?
    a. 6,801 L
    b. 9,425 L
    c. 21,923 L
    d. 18,850 L

27. A reservoir has a width of 9 m and a length of 24 m. What is the area of the floor?
    a. 104 m^2
    b. 216 m^2
    c. 184 m^2
    d. 204 m^2

MATH TEST QUESTIONS

28. An Operator drove 69.9 km on Monday, 18 km on Tuesday, 71.7 km on Wednesday, 0 km on Thursday, and 36.8 km on Friday. What is the average number of kilometres driven per day during the five-day work week?
    a. 56.5 km
    b. 39.3 km
    c. 164.6 km
    d. 201.1 km

29. It takes 6 hours to fill a 30,000 litre tank. What is the pumping rate in L/second?
    a. 1.39
    b. 83.1
    c. 1.45
    d. 2.5

30. What is the detention time for a 450 L tank that has an outflow of 0.5 L/second?
    a. 33 minutes
    b. 15 minutes
    c. 45 minutes
    d. 9 minutes

31. How many litres of water are in a tank that is 12 m long, 3.5 m wide, and 1.5 m high?
    a. 12,200 L
    b. 20,400 L
    c. 33,000 L
    d. 63,000 L

32. How many litres of wastewater are contained in a 300 mm force main that is 600 m long?
    a. 6,300 L
    b. 32,326 L
    c. 42,412 L
    d. 640,123 L

33. A tank is 588 cm long and 6.50 m wide. What is the floor area of the tank?
    a. 383.5 m^2
    b. 38.2 m^2
    c. 93.5 m^2
    d. 930.5 m^2

34. At the beginning of a week, a flow totalizer reads 1,857 L. Seven days later the flow totalizer reads 2,699 L. What is the average daily flow?
    a. 179 L/day
    b. 79 L/day
    c. 59 L/day
    d. 120 L/day

MATH TEST QUESTIONS

35. The wastewater level in a tank is dropping at a rate of 0.3 m/hr from an influent tank that is 11.6 m long, 7.5 m wide, and 4.6 m high. How many litres of wastewater flow out of the tank in one hour?
    a. 17,328 L
    b. 26,100 L
    c. 2,650 L
    d. 2,805 L

36. The removal efficiency for total solids where the influent is 900 mg/L and the effluent is 663 mg/L is:
    a. 26.3%
    b. 35.7%
    c. 66.7%
    d. 27.3%

37. A clarifier has a flow of 4,200 m^3 per day and a suspended solids concentration of 2,900 mg/L. The has a diameter of 10 m and is 2.5 m deep. The solids loading gin kg/day is:
    a. 12,180 kg/day
    b. 10,500 kg/day
    c. 16,550 kg/da
    d. 24,360 kg/day

38. A water tank is 2.4 m long, and 1.8 m wide, and has 1.2 m of water in it in the morning. If we add another 850 L of water to the tank, what will be the height of water in the tank?
    a. 1.4 m
    b. 2.6 m
    c. 3.6 m
    d. 1.8 m

39. A tank has a length of 24 m, a width of 12 m, and a height of 7 m. What is the area of the top of the tank?
    a. 576 m^2
    b. 288 m^2
    c. 2,016 m^2
    d. 333 m^2

MATH TEST QUESTIONS

40. If a cylindrical tank has the following dimensions, its volume would be:

9 m

12 m

2.5 m
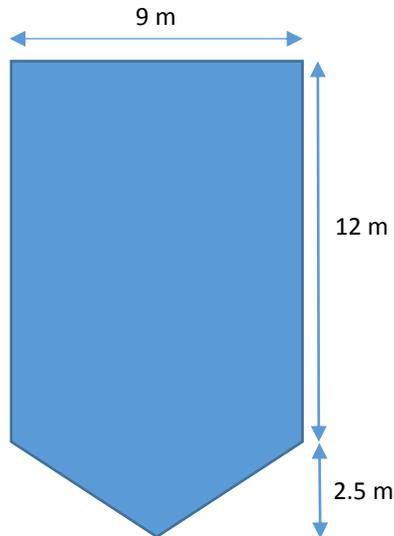
    a. 816.7 m^3
    b. 776.9 m^3
    c. 922.8 m^3
    d. 392.7 m^3

41. A water tank has a diameter of 5 m and a height of 2.5 m. The volume of the tank in litres is:
    a. 49.1
    b. 49,087
    c. 196.4
    d. 196,428

42. A Total of 3,105 m^3 passes through a flow meter in three days. What is the flowrate in L/day?
    a. 3,105,000
    b. 1,035,000
    c. 99,000
    d. 1,045,000

43. At a flow rate of 2,700 L/hr, how long will it take to fill an upright polymer tank with a diameter of 5 m and a height of 3.9 m?
    a. 28.4 hours
    b. 113.5 hours
    c. 56.8 hours
    d. 7.2 hours

44. How long will it take to fill a 4,800 L truck if the pumping rate is 320 L/minute?
    a. 30 minutes
    b. 45 minutes
    c. 20 minutes
    d. 15 minutes

MATH TEST QUESTIONS

45. What is the detention time for a lagoon that holds 2,500 m^3 of wastewater, and has a discharge of 10 m^3/day?
    a. 250 days
    b. 300 days
    c. 450 days
    d. 600 days

46. The volume of water displaced if a ball with a diameter of 45 cm is submerged in a tank of water is:
    a. 45.1 litres
    b. 28.6 litres
    c. 47.7 litres
    d. 12.9 litres

47. A rain barrel measures 1.5 m in height, and has a diameter of 0.75 m. Its volume in litres is
    a. 725.9 L
    b. 333.9 L
    c. 662.9 L
    d. 425.3 L

48. What is the chlorine demand if the chlorine residual is 2 mg/L and 8.7 mg/L of chlorine has been added?
    a. 5.3 mg/L
    b. 1.2 mg/L
    c. 4.7 mg/L
    d. 6.7 mg/L

49. How many kilograms of a chemical applied at a rate of 50 mg/L are needed to dose 250,000 L
    a. 10 kg
    b. 15 kg
    c. 12.5 kg
    d. 8 kg

50. How many kilograms of 75% available chlorine are needed to provide 1.5 kg of chlorine?
    a. 2 kg
    b. 3 kg
    c. 6 kg
    d. 9 kg

MATH TEST QUESTIONS

Answer Sheet

1. a	26. d
2. c	27. b
3. a	28. b
4. c	29. a
5. b	30. b
6. d	31. d
7. a	32. c
8. b	33. b
9. b	34. d
10. c	35. b
11. a	36. a
12. c	37. a
13. b	38. a
14. a	39. b
15. d	40. a
16. a	41. b
17. d	42. b
18. c	43. a
19. a	44. d
20. a	45. a
21. c	46. c
22. c	47. c
23. b	48. d
24. b	49. c
25. c	50. a