



Basic Math Diagnostic Test

Solve for X in each problem given below:

1. $8.1 = (3)(X)(1.5)$

X = _____

2. $\frac{233}{X} = 44$

X = _____

3. $940 = \frac{X}{(0.785)(90)(90)}$

X = _____

4. $56.5 = \frac{3800}{(X)(8.34)}$

X = _____

5. $46 = \frac{(105)(X)(8.34)}{(0.785)(100)(100)(4)}$

X = _____

6. $6358.5 = (0.785)(X^2)$

X = _____

7. $9.5 - X = 8.7$

X = _____

Express the following percents as fractions or fractions as percents. Be sure fractions are given in lowest terms.

8. $40\% =$ _____

9. $\frac{5}{12} =$ _____

10. $\frac{2}{10} =$ _____

Express the following percents as decimals or decimals as percents.

11. $19\% =$ _____

12. $0.168 =$ _____

13. $0.027 =$ _____

Complete the percent problems given below:

14. 220 is what percent of 250? _____

15. What is 6% of 13,530? _____

16. 58 is 7% of what number? _____

Calculate the arithmetic mean value of each problem below:

17. mg/L: 140
136
152
131
148
159
166

Solve the exponential problems below:

18. 15^2

19. 9^3

20. $18^{1.9}$

21. $144^{1/2}$

Solve the following problems containing radicals:

22. $\sqrt{324}$

23. $\sqrt[3]{1728}$

24. $\sqrt[4]{1296}$

Solve the following problems using the [ABC & C2EP Formula/Conversion Table](#) on our website.

25. Determine the number of feet in $\frac{3}{4}$ of a mile. _____

26. A concentration of 195 mg/L is equivalent to a concentration of what percent? _____
27. For solids treatment, a total area of 60,000 ft² will be required. How many acres is this? _____
28. A reservoir contains 50 ac-ft of water. How many ft³ of water does it contain? _____
29. The flow through a pipeline is 8.4 cfs. What is the flow in gpd? _____
30. A chemical holding tank has a diameter of 24 feet. What is the circumference of the tank in feet? _____
31. A basin has a length of 45 feet and a width of 12 feet. Calculate the area in square feet. _____
32. Calculate the lateral surface area (in ft²) of a cone with a radius of 3 feet and a height of 9 feet. _____
33. Calculate the cross-sectional area (in ft²) for a 2 ft diameter main that has just been laid. _____
34. A chemical hopper is cone shaped and covered. It has a diameter of 4 feet and a depth of 7 feet. Calculate the total surface area of the hopper (in ft²). _____

35. A cylindrical storage tank is used to hold the day's supply of chemical. If the tank is 3 feet wide and 8 feet deep, what is the total exterior surface area of the cylinder in square feet? _____
36. Calculate the volume in gallons for a basin that measures 22 feet by 11 feet by 5 feet. _____
37. Calculate the volume in ft^3 of a cone shaped chemical hopper with a diameter of 12 feet and a depth of 18 feet. _____
38. A cork is placed in a channel and travels 370 feet in 2 minutes. What is the velocity of the water in the channel, ft/min? _____
39. A water main with a diameter of 18 inches is determined to have a velocity of 182 feet per minute. What is the flow rate in gpm? _____
40. A channel is 3 feet wide with water flowing to a depth of 2 feet. If the velocity in the channel is found to be 1.8 fps, what is the cubic feet per second flow rate in the channel? _____

Answers

- | | | | |
|--------------|------------|----------------------------------|-------------------------------|
| 1. 1.8 | 11. 0.19 | 21. 12 | 31. 540 ft ² |
| 2. 5.3 | 12. 16.8% | 22. 18 | 32. 89.41 ft ² |
| 3. 5,976,990 | 13. 2.7% | 23. 12 | 33. 3.14 ft ² |
| 4. 8.06 | 14. 88% | 24. 6 | 34. 58.31 ft ² |
| 5. 1649.42 | 15. 811.8 | 25. 3960 ft | 35. 89.53 ft ² |
| 6. 90 | 16. 828.57 | 26. 0.0195% | 36. 9050.8 gal |
| 7. 0.8 | 17. 147.43 | 27. 1.38 acres | 37. 678.58 ft ³ |
| 8. 2/5 | 18. 225 | 28. 2,179,144.39 ft ³ | 38. 185 ft/min |
| 9. 41.67% | 19. 729 | 29. 5,428,684.8 gpd | 39. 2,404.5 gpm |
| 10. 20% | 20. 242.67 | 30. 75.4 ft | 40. 10.8 ft ³ /sec |

# missed	score
1	97.5
2	95
3	92.5
4	90
5	87.5
6	85
7	82.5
8	80
9	77.5
10	75
11	72.5
12	70
13+	Fail

