

101 Test review Problems

Basic Geometry

1. A swimming pool has to be drained for maintenance. The pool is shaped like a cylinder with a diameter of 9 m and a depth 2 m. If the water is pumped out of the pool at the rate of 14 m^3 per hour, how many hours does it take to empty the pool? Use the value 3.14 for π and round your answer to the nearest hour.
2. A propane tank is being filled. It is shaped like a cylinder of 1.5 m diameter and 2 m in length. If it is filled at the rate of 0.5 m^3 per min, how long would it take to fill the tank? Use the value of 3.14 for π and round your answer to the nearest minute.

Percentages

3. A movie club surveyed 250 high school students. The students were asked how often they go to the movies and whether they prefer action movies or dramas. Their responses are summarized in the following table.

| | Twice a month or less | Three times a month or more |
|---------------|------------------------------|------------------------------------|
| Action | 78 | 32 |
| Drama | 102 | 38 |

- (a) What percentage of the students go to the movies twice a month or less?
- (b) What percentage of the students prefer dramas?

4. Don Banks surveyed 500 people. The participants were asked how often they went out to eat and if they preferred pizza or hamburger. Their responses are summarized in the following table.

| | Once a month or less | Two times a month or more |
|------------------|-----------------------------|----------------------------------|
| Pizza | 200 | 100 |
| Hamburger | 100 | 100 |

- (a) What percentage of the folks eat out once a month or less?
- (b) What percentage of the folks prefer hamburger?

5. A sofa is on sale for 34 % off. The sale price is \$429. What is the regular price?

6. A computer is now selling at 80% of its regular price and it is now priced at \$720. What is the regular price?

7. A matinee movie ticket sells at \$7.50. Matinee ticket price is 25% off the regular ticket price. What is the regular ticket price?

8. During a “going-out-of-business” sale, a store has marked down everything it sells by 88%. An item now can be bought at \$24. What is its regular price?

Evaluations:

9. Evaluate the following expression:

$$24 \div [9 \times (20-18)-12]$$

10. Evaluate the following expression

$$36 \div [3 \times (20-16)-6]$$

11. Evaluate

$$-15 - 10 \div (-5)$$

12. Evaluate

$$21 \div 7 + 2$$

13. Add $\frac{3}{4} + \frac{1}{2}$ Write your answer in simplest form

14. Subtract $\frac{3}{5} - \frac{1}{3}$ Write your answer in simplest form

15. Add $5 + (-1) =$

$$-7 + (-3) =$$

16. Simplify the following expression:

$$3x^2 - 10 - 8x^2 + 12 + 7x$$

17. Simplify the following expression:

$$3x^3 - 5 - 8x^2 - 12x + 7x^3 + 12 + 7x$$

Solving for the unknown:

18. Solve for P : $B = 4P$

19. Solve for z : $\frac{z-w}{3} = x$

Translating statements into algebra:

20. Write an inequality for the following statement:
 c is less than or equal to 4

21. Write an inequality for the following statement:
To be able to get on the ride the child's height h must be at least 48 inches

22. Write an inequality for the following statement:

The total weight of persons in the elevator w must not exceed 1500 pounds

23. Write an algebraic expression for the following statement:
13 more than three times Shrek's age s
24. Donatello transports beverage bottles by truck. Some cans weight 12 oz while others weigh 30 oz. If x is the number of 12-oz cans and there are a total of 1000 cans in the truck write an expression for the combined weight of all the cans in the truck.
25. Julie McCarthy takes classes in two different colleges, Bright Star and Lucky C. She is enrolled for a total of 18 credits in both colleges combined. If tuition at Bright Star College is \$200 per credit and the tuition at Lucky C College is \$150 per credit, write an expression for the total tuition she pays if she is enrolled in x credits at Bright Star.

Straight lines and applications:

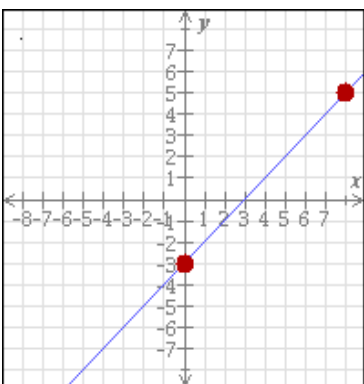
26. Find the slope of the line passing through the points (3, -3) and (-5, 9)

27. Find the slope of the line passing through the points (-2, 3) and (1,0)

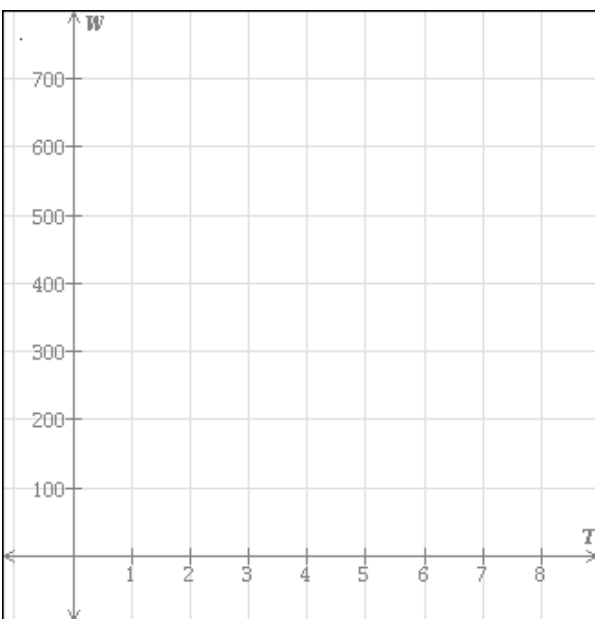
28. Find an ordered pair (x,y) that is a solution to the equation $2x + y = 8$

29. Find an ordered pair (x,y) that is a solution to the equation $-x + 2y = 10$

30. Write an equation for the line below:



31. The pool guy is filling the rich widow's pool with water. He is adding water at a rate of 30 liters per minute. There are 400 liters in the pool to begin with. Let W represent the amount of water in the pool (in liters), and let T represent the number of minutes that water has been added. Write an equation relating W to T and then graph the equation using the axes below:



32. Fill in the table using the function rule: $y = 2x - 3$

| x | y |
|-----|-----|
| -1 | |
| 0 | |
| 1 | |
| 2 | |

33. What is the equation of the straight lines passing through the points (2,2) and (-7,-5)

34. What is the equation of the straight lines passing through the points (0 ,-2) and (-1,-3)

35. A straight line has the equation $2x + y = 5$

- (a) Find the equation of a line parallel to it and passing through (2, -1)
- (b) Find the equation of a line perpendicular to it and passing through (2, -1)

36. Jose bought a desktop computer and a laptop computer. Before finance charges, the laptop cost \$450 less than the desktop. He paid for the computers using two different financing plans. For the desktop the interest rate was 6.5% per year, and for the laptop it was 9% per year. The total finance charges for one year were \$409 How much did each computer cost before finance charges?

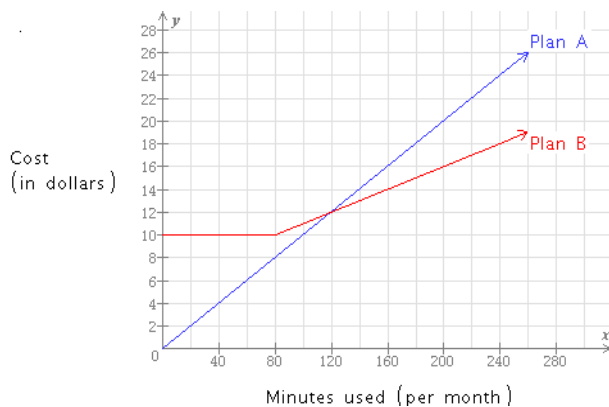
37. The Johnson family and the Rogers family each used their sprinklers last summer. The water output rate for the Johnson family's sprinkler was 15 L per hour. The water output rate for the Rogers family's sprinkler was 20 L per hour. The families used their sprinklers for a combined total of 45 hours, resulting in a total water output of 825 L. How long was each sprinkler used?

Johnson family's sprinkler:

Rogers's family's sprinkler:

38. Two numbers add to 67. The larger number is 7 more than the smaller number. What are the two numbers?

39. Samantha Villarreal can choose Plan A or Plan B for her long distance charges. For each plan, the cost (in dollars) depends on minutes (per month) as depicted below:



- (a) If she makes 160 minutes of long distance calls for the month, which plan costs less?
How much less does it cost than the other plan?
- (b) For what number of minutes do the two plans cost the same? If the time spent on long distance calls is less than this amount, which plan costs less?

40. Solve the proportion for w : (Round the answer to the nearest tenth)

$$\frac{11}{3} = \frac{w}{10}$$

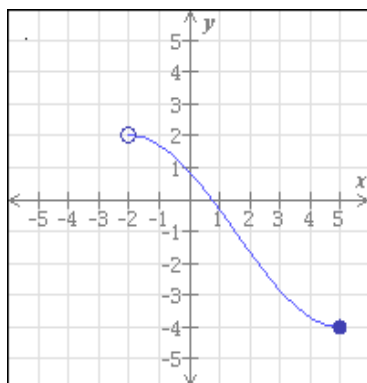
Functions:

41. The functions f and g are given below

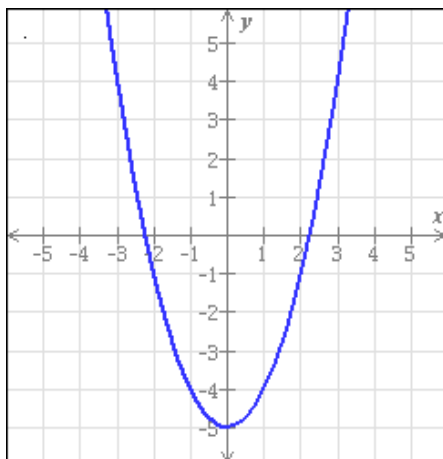
$$f(x) = 4x^2 - 3x \quad g(x) = -2x + 10$$

Find $f(-3)$ and $g(4)$ simplifying the abusers as much as possible

42. The graph of the function is given below. Write its domain and range.



43. The graph of a function f is given below. Find $f(1)$ and find one value of x for which $f(x) = -1$



Formulas you want to memorize:

Equation of a straight line in slope-intercept form

$$y = mx + b$$

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

Volume of a cylinder $V = \pi r^2 h$

Surface area of a cylinder $= 2\pi r^2 + 2\pi r h$

Circumference of a circle $2\pi r$

Area of a circle πr^2

Distance = Rate x Time