

1. Solve the equation.  $-3(x - 7) = 4x + 4$
2. What is the slope of the line that passes through (10, -1) and (-5, 8)?
3. Solve the inequality.  $-3(x + 4) \geq x + 8$
4. What are the x-intercepts of  $y = -3(x - 9)(x + 5)$ ?
5. Factor the expression.  $16x^3 - 44x^2 - 42x$
6. Factor the expression.  $2x^2 + 11x - 21$
7. What is the axis of symmetry of the graph of the function  $y = 3(x - 4)(x + 10)$ ?

8. Simplify the expression.  $\frac{20x^3yz^{-5}}{12xy^3z}$

9. What is the complete factorization of  $32x^6 - 2x^2$ ?

10. Classify the polynomial function by degree.  $y = -2x^3 + 3x^4 - 7 + 12x$

11. If  $x + 4$  is a factor of  $x^3 + 6x^2 + 5x - 12$ , what are the other factors?  
(use synthetic division)

12. What is the complete factorization of  $2x^3 - 5x^2 - 18x + 45$ ?

13. List the possible rational zeros of  $f(x) = 2x^3 + 3x^2 - 11x - 6$

14. What is the value of  $(-27)^{\frac{4}{3}}$  ?

Use the functions  $f(x) = 5x^2$  and  $g(x) = 3x^{\frac{1}{2}}$  to answer questions 15 and 16.

15. What is  $g(f(x))$  ?

16. Perform the operation.  $\frac{f(x)}{g(x)}$

17. What is the inverse of the function  $f(x) = \sqrt[3]{x+7}$  ?

18. Complete the following for characteristics of function inverses.

A The compositions of the functions equal \_\_\_\_\_.

B The graphs are reflections of each other across the line \_\_\_\_\_.

C The operations of the functions \_\_\_\_\_ each other.

19. The graph of  $f(x) = \sqrt{x}$  is shifted 5 units down and 2 units to the left.  
Write the equation of the translated function.

20. Simplify the expression.  $\sqrt[3]{16a^3b^4cd}$

21. Simplify the expression.  $\sqrt[5]{\frac{c^{10}}{d^{25}}}$

22. Solve the equation.  $x^6 = 729$

23. Solve the equation.  $(x+3)^{1/5} = 3$

24. Solve the equation.  $\sqrt[5]{20x+10} = \sqrt[5]{30x-15}$

25. Is this an exponential decay or exponential growth function?

$$f(x) = 3\left(\frac{4}{5}\right)^{-x}$$

26. If you buy a new car for \$30,000 and the value depreciates 14.5% each year, what will be the value of the car in 4 years?

27. Simplify the expression.  $3e^7 \cdot e^{-2}$

28. Simplify the expression.  $(-3e^{-5x})^3$

29. Evaluate  $\log_6 216$ ?

30. Expand  $\log \frac{x^3}{5}$ ?

31. Solve the equation.  $3^x = 73$

32. Solve the equation.  $\log_4(x-7) = 2$

33. Simplify the expression.  $\frac{x^2 + 5x + 6}{x^3 + 3x^2}$

34. What is the product of  $\frac{x^2 - 1}{12x^2 + 24x} \cdot \frac{4}{x^2 + x}$ ?

35. What is the sum of  $\frac{x^2}{x+6} + \frac{6x}{x+6}$ ?

36. What is the third term of the sequence?  $a_n = -2n + 7$

37. Which series is represented by  $\sum_{i=1}^4 (4i + 2)$ ?

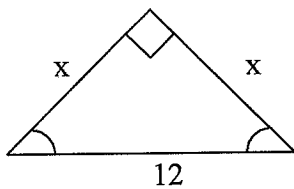
38. What is the difference between an arithmetic sequence and a geometric sequence?

Arithmetic:

Geometric:

39. Write a rule that describes the pattern 1, 6, 11, 16, ...

40. What is the value of  $x$  in the triangle shown?

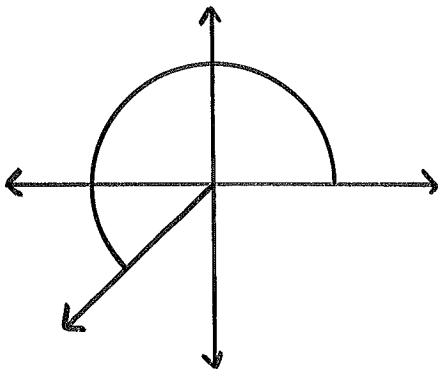


41. How many degrees is  $\frac{11\pi}{3}$ ?

42. A handicapped ramp has a height of 4 feet and a horizontal length of 27 feet.  
What is the angle  $\theta$  of the ramp (angle of elevation)?

43. Name three angles that are coterminal with  $160^\circ$

44. What angle measure is shown?



45. Solve the equation.  $-4x - 7 = 11$