

Name: _____

Due Date: _____

Teacher: _____

Parent Sign: _____

Questions

1. Evaluate $12 \div 0$.
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2. Evaluate $0 \div 8$.
3. True or false: $5 \div 0 = ?$ (infinity).
4. If you have 0 cookies and 5 friends, how many cookies does each friend get? ($0 \div 5$)
5. If you have 5 cookies and 0 friends, how many cookies does each friend get? ($5 \div 0$)
6. You want to divide 10 apples equally among x people. For which value(s) of x is the expression $10 \div x$ undefined?
7. Explain, in one sentence, why dividing a nonzero number by zero is undefined (conceptual).
8. A line has a rise of 7 and a run of 0. What is its slope? ($7 \div 0$)
9. Which of these is undefined: $0 \div 0$ or $5 \div 0$? Mark both that apply.
10. Evaluate (if possible) $3/(x-2)$ when $x = 2$.
11. Determine whether $(x+4)/(x+4)$ is defined at $x = -4$.
12. Simplify $(x^2 - 4)/(x - 2)$ and state whether the original expression is defined at $x = 2$.
13. A recipe uses 0 liters of water to make 0 jars of jam. How many liters of water per jar is that? ($0 \div 0$) – classify this as defined, undefined, or indeterminate.
14. Is the statement " $0 \div a = 0$ for any nonzero a " true or false?
15. Solve for x : $(x+1)/(x-3) = 0$.
16. For which value(s) of x is the expression $5/(x^2 - 9)$ undefined?
17. Simplify $(x^2 - 1)/(x - 1)$ and say whether the expression is defined at $x = 1$.
18. If average speed = distance \div time, what happens to the formula if time = 0 (distance nonzero)? Explain briefly.
19. Evaluate the expression $(x - 2)/(x - 2)$ for $x \neq 2$ and for $x = 2$.
20. Is $\frac{0}{0}$ equal to 0? Explain with a short reason.
21. For which x is the expression $(2x - 6)/(x - 3)$ undefined?
22. Determine the domain (all real x for which expression is defined) of $f(x) = 1/(x - 4)$.
23. A machine produces 50 widgets per hour. How many hours are required to produce 0 widgets? (time = widgets \div rate) Interpret the division result.
24. Simplify and classify at $x = 1$: $(x^3 - 1)/(x - 1)$.
25. True or false: Expressions that simplify algebraically to the same formula always have exactly the same values for all x , including points where the original had division by zero.
26. Solve for x : $(x - 5)/(x - 5) = 1$.
27. Classify each expression as defined, undefined, or indeterminate: a) $\frac{0}{0}$ b) $\frac{7}{0}$ c) $\frac{0}{7}$.
28. A school has 0 teams and 20 students. If teams are formed equally, how many students per team? ($20 \div 0$) – classify.



Math Worksheet for 9th Grade

Division by zero

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29. Does the expression $(x^2 - 9)/(x - 3)$ have a removable issue at $x = 3$? If so, what is the simplified form?
30. Evaluate the expression $1/(0.0001 - 0.0001)$.
31. If $p(x) = (x^2 - x)/(x)$, for which x is $p(x)$ undefined?
32. True or false: Multiplying both sides of an equation by zero is a safe algebraic step (it never causes loss of solutions). Briefly justify.
33. Consider $g(x) = (x - 2)/(x^2 - 4)$. For which x is g undefined?
34. If a fraction simplifies to 4 after canceling $(x - 3)$ from numerator and denominator, is the original expression necessarily equal to 4 at $x = 3$? Explain.
35. Find all x that make the expression $(3x + 6)/(x + 2)$ undefined.
36. A car travels 0 miles in 0 hours. What is its average speed? Classify $0 \div 0$.
37. Determine whether $(x^2 - 5x + 6)/(x - 2)$ is defined at $x = 2$, and if not, simplify the expression for $x \neq 2$.
38. Is the slope between points $(2, 4)$ and $(2, 9)$ defined? Compute and classify.
39. If $h(x) = (x^2 - 4x)/(x)$, simplify $h(x)$ and state where it is undefined.
40. Explain the difference between "undefined" and "indeterminate" in one or two sentences.
41. For which integer values of n is $1/(n - 7)$ defined?
42. Solve: $(x^2 - 1)/(x - 1) = 3$. Check validity of any solutions.
43. If you divide \$100 equally among x people, for what x is the result undefined? What real-world meaning does that have?
44. Evaluate the limit-like question informally: If you simplify $(x^2 - 1)/(x - 1)$ to $x + 1$, what happens at $x = 1$? (No formal limit required – give intuitive answer.)
45. Which of these operations can give $0 \div 0$: cancelling a common factor or plugging a value that makes numerator and denominator zero? Choose and explain briefly.
46. Is the expression $(2x)/(x)$ equal to 2 for $x = 0$? Explain.
47. Determine all x such that the expression $(x^2 - 2x)/(x)$ equals 5.
48. True or false: It is valid to divide both sides of the equation $0 = 0$ by 0. Explain briefly.
49. A box contains 0 items. You distribute them equally to 0 boxes. How many items per box is that? Classify.
50. Give one everyday example or analogy that helps explain why division by zero is not allowed.