

When an Expression Is Undefined

Name: _____

Date: _____

Score: _____ / 18

Quick Review and Helpful Hints

A fraction is *undefined* when its denominator equals 0, because dividing by zero is not allowed. To find where an expression is undefined, set the *denominator* equal to 0 and solve for x .

▶ **Example:** For what value of x is $\frac{1}{x-2}$ undefined? **Work:** Set the denominator to 0: $x - 2 = 0$, so $x = 2$.

★ **Answer:** $x = 2$



Never divide by zero.

Practice Problems

Find where each expression is undefined.

1. $\frac{1}{x-2}$

8. $\frac{1}{x-7}$

2. $\frac{1}{x+3}$

9. $\frac{3}{x+1}$

3. $\frac{1}{x}$

10. $\frac{1}{x-10}$

4. $\frac{5}{x-1}$

11. $\frac{1}{x+2}$

5. $\frac{1}{x+5}$

12. $\frac{4}{x-6}$

6. $\frac{2}{x-4}$

13. Can you divide by 0?

7. $\frac{1}{2x}$

14. $\frac{1}{x}$ undefined at

Word Problems

15. A formula has $x - 3$ in the denominator. Where is it undefined?

16. For what value is $\frac{1}{x+4}$ undefined?

17. Why is $\frac{5}{0}$ undefined?

18. At what value is $\frac{1}{x-9}$ undefined?



Answer Keys

1. $x = 2$

2. $x = -3$

3. $x = 0$

4. $x = 1$

5. $x = -5$

6. $x = 4$

7. $x = 0$

8. $x = 7$

9. $x = -1$

10. $x = 10$

11. $x = -2$

12. $x = 6$

13. No

14. $x = 0$

15. $x = 3$

16. $x = -4$

17. division by zero

18. $x = 9$

Step-by-Step Explanations

1. Start by naming the process: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x - 2 = 0 \Rightarrow x = 2$. So the final answer is $x = 2$.

2. A good way to think about this is: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x + 3 = 0 \Rightarrow x = -3$. So the final answer is $x = -3$.

3. Step by step: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x = 0$ makes the bottom 0. So the final answer is $x = 0$.

4. Take it one move at a time: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x - 1 = 0 \Rightarrow x = 1$. So the final answer is $x = 1$.

5. Start by naming the process: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x + 5 = 0 \Rightarrow x = -5$. So the final answer is $x = -5$.

6. A good way to think about this is: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x - 4 = 0 \Rightarrow x = 4$. So the final answer is $x = 4$.

7. Step by step: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $2x = 0 \Rightarrow x = 0$. So the final answer is $x = 0$.

8. Take it one move at a time: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x - 7 = 0 \Rightarrow x = 7$. So the final answer is $x = 7$.

9. Start by naming the process: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x + 1 = 0 \Rightarrow x = -1$. So the final answer is $x = -1$.

10. A good way to think about this is: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x - 10 = 0 \Rightarrow x = 10$. So the final answer is $x = 10$.

11. Step by step: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x + 2 = 0 \Rightarrow x = -2$. So the final answer is $x = -2$.

12. Take it one move at a time: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x - 6 = 0 \Rightarrow x = 6$. So the final answer is $x = 6$.

13. Start by naming the process: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is No - division by zero is undefined. So the final answer is No.

14. A good way to think about this is: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x = 0$ makes the bottom 0. So the final answer is $x = 0$.

15. Step by step: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x - 3 = 0 \Rightarrow x = 3$. So the final answer is $x = 3$.

16. Take it one move at a time: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x + 4 = 0 \Rightarrow x = -4$. So the final answer is $x = -4$.

17. Start by naming the process: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is The denominator is 0 (dividing by zero). So the final answer is division by zero.

18. A good way to think about this is: A fraction is undefined when its denominator is zero, so set the denominator equal to zero and solve. The setup/work is $x - 9 = 0 \Rightarrow x = 9$. So the final answer is $x = 9$.



Want Even More TSIA2 Math Practice?



The Most Comprehensive TSIA2 Math Preparation Bundle

Prep books, workbooks, and full-length practice tests

Complete review, detailed explanations, and realistic test practice



Scan Me

Prep Books
Workbooks
Practice Tests

Important: These TSIA2 Math resources are made for extra practice after the worksheet. Scan the QR code above for the complete TSIA2 Math preparation bundle.

Skill Review

- ✓ Builds number sense, algebra, geometry, and data skills
- ✓ Supports steady review before the TSIA2 test
- ✓ Great for tutoring, homework, and independent practice

Build the foundation.

Test Practice

- ✓ Full-length practice tests for realistic pacing
- ✓ Detailed answer explanations for every question
- ✓ Useful after students finish topic worksheets

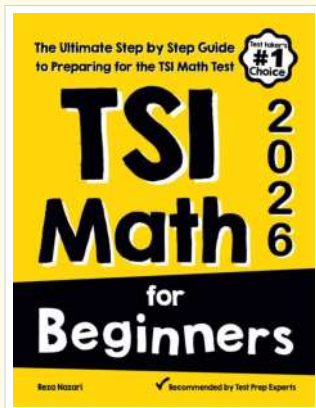
Practice with purpose.

Confidence

- ✓ Turns mistakes into targeted review
- ✓ Helps students see progress over time
- ✓ Keeps TSIA2 preparation organized and calm

Move forward prepared.

STUDENT FAVORITE • Master TSIA2 Math From the Ground Up



TSI Math for Beginners

The Ultimate Step-by-Step Guide to Preparing for the TSI Math Test

Written by a top math teacher and aligned with the latest TSIA2 Math test. From fractions and percents to algebra and geometry — explained the easy way.

- ✓ **Complete coverage** of every TSIA2 Math topic — perfect companion to these worksheets
- ✓ **Step-by-step explanations** with worked examples on every topic
- ✓ **QR codes in every chapter** for free video lessons & bonus practice
- ✓ **2 full-length practice tests** with detailed answer keys
- ✓ Perfect for self-study or the classroom

* **STUDENT'S #1 CHOICE**

Teacher-recommended • trusted TSIA2

prep

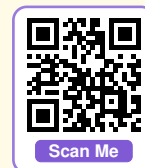
→ **DOWNLOAD INSTANTLY**



Scan Me

Instant download • any device

□ **FIND ON AMAZON**



Scan Me

Paperback on Amazon

Pair these free worksheets with *TSI Math for Beginners* and you have a complete self-paced TSIA2 Math path — concept lessons, daily practice, and full exam-style reviews. → EffortlessMath.com