Comparing irrational numbers worksheet

Classifying Rational and Irrational Numbers

1. For each of the numbers below, decide whether it is rational or irrational. Explain your answers.

Number	Reasoning
0.21	
$\frac{3}{12}$	
$\sqrt{12}-2$	
$\frac{\sqrt{12}}{4}$	
$4.125...$	
$(\sqrt{12}-4)(4+\sqrt{12})$	
12.52 (rounded to 2 d.p.)	

Estimate /Compare Irrational Numbers

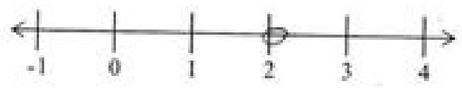
8.NS.A.2

Denise Langley

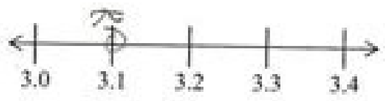
Locating Irrational Numbers

Name Date

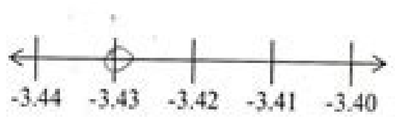
1. Plot $\sqrt{6}$ on the number line below and explain the location of the point.



2. Plot π on the number line below and explain the location of the point.



3. Plot -3.428571 ... on the number line below and explain the location of the point.



8 will past 2 up to a 3.

Mathematics Formative Assessment System
Florida Center for Research in Science, Technology, Engineering, and Mathematics

Student Worksheet

Name_____ **Date**_____

Note: We do not leave enough room for copy and past activities in order to display the questions in fewer pages.

Directions:

- Use the file "Spirals.gsp" to enter the numbers.

1. Define rational numbers.

2. Define irrational numbers.

3. Enter the following rational numbers ($\frac{1}{4}, \frac{1}{5}, \frac{1}{8}, \frac{7}{10}$):

1st Rational: $\frac{1}{4}$ Copy and Paste the GSP result in the space provided below:

2nd Rational: $\frac{1}{5}$ Copy and Paste the GSP result in the space provided below:

3rd Rational: $\frac{1}{8}$ Copy and Paste the GSP result in the space provided below:

4th Rational $\frac{7}{10}$ Copy and Paste the GSP result in the space provided below:

4. Enter the following irrational numbers ($\pi, e, \sqrt{2}$).

1st Irrational: e Copy and Paste the GSP result in the space provided below:

2nd Irrational: π Copy and Paste the GSP result in the space provided below:

3rd Irrational: $\sqrt{2}$ Copy and Paste the GSP result in the space provided below:

5. Compare the sketches from questions 3 and 4, and describe the similarities and differences of each sketch focusing on rational and irrational number behaviors.

Comparing and Ordering Rational Numbers **Name**_____

Fill in each blank with < , > , or = to make each sentence true. Write the decimal notation beneath each fraction to check your answer.

Example: $\frac{1}{2} \_\_ \frac{1}{3}$

$\frac{1}{2} > \frac{1}{3}$

0.5 > 0.333

On your graphing calculator, Type 1, press the a b/c button (this is the fraction bar), type 2 Press EXE to enter the fraction, press F ⟷ D (this converts the fraction to a decimal and vice versa). Repeat this for the fraction 1/3.

1. $\frac{2}{3} \_\_ \frac{5}{8}$

2. $\frac{3}{4} \_\_ \frac{5}{7}$

3. $\frac{4}{15} \_\_ \frac{5}{19}$

4. $\frac{3}{14} \_\_ \frac{15}{70}$

5. $\frac{14}{5} \_\_ \frac{30}{13}$

6. $\frac{3}{5} \_\_ \frac{7}{8}$

7. $\frac{7}{10} \_\_ \frac{15}{19}$

8. $\frac{5}{12} \_\_ \frac{3}{16}$

9. $\frac{5}{2} \_\_ \frac{10}{4}$

10. $\frac{4}{13} \_\_ \frac{3}{9}$

11. $\frac{7}{9} \_\_ \frac{5}{7}$

12. $\frac{9}{7} \_\_ \frac{7}{4}$

Write the fractions in order from least to greatest. Write the decimal notation beneath each fraction as you did in problems 1 - 12.

13. $\frac{3}{8} \quad \frac{1}{4} \quad \frac{7}{8}$

14. $\frac{16}{19} \quad \frac{17}{20} \quad \frac{18}{21}$

15. $\frac{3}{5} \quad \frac{18}{29} \quad \frac{24}{39}$

Comparing irrational numbers worksheet pdf. Compare numbers to 100 worksheet. Comparing irrational numbers. Comparing and ordering irrational numbers worksheet.

1. If two irrational numbers radicals are in the form (a + √b) and (c + √d), estimate the value of each irrational number and compare them. 2. If two irrational numbers are in the form √a and √b, square each irrational number to get rid of the square root. Then, compare them. Example 1 : Compare (√3 + 5) and (3 + √5) and write , or = in between them. Answer : Step 1 :Approximate √3. √3 is between 1 and 2Step 2 :Approximate √5. √5 is between 2 and 3. Step 3 :Use your approximations in the above steps to estimate the values of the given irrational numbers.√3 + 5 is between 6 and 73 + √5 is between 5 and 6So,√3 + 5 > 3 + √5Example 2 : Compare (√2 + 4) and (2 + √4) and write , or = in between them. Answer : Step 1 :Approximate √2. √2 is between 1 and 2 Step 2 :Approximate √4. √4 is equal 2Step 3 :Use your approximations in the above steps to estimate the values of the given irrational numbers.√2 + 4 is between 5 and 62 + √4 is equal to 4So,√2 + 4 > 2 + √4Example 3 : Compare 4√2 and 3√3 and write , or = in between them. Answer : Step 1 :Square 4√2. (4√2)2 = (4)2(√2)2(4√2)2 = (16)(2)(4√2)2 = 32 -----> (1)Step 2 :Square 3√3. (3√3)2 = (3)2(√3)2(3√3)2 = (9)(3)(3√3)2 = 27 -----> (2)Step 3 :Comparing (1) and (2), 32 > 27 -----> 4√2 > 3√3Example 4 : Compare (√12 + 6) and (12 + √6) and write , or = in between them. Answer : Step 1 :Approximate √12. √12 is between 3 and 4 Step 2 :Approximate √6. √6 is between 2 and 3Step 3 :Use your approximations in the above steps to estimate the values of the given irrational numbers.√12 + 6 is between 9 and 1012 + √6 is between 12 and 14So,√12 + 6 5 + √6Example 6 : Compare (√3 + 3) and (√3 + √9) and write , or = in between them. Answer : √3 + 3 -----(1)√3 + √9 = √3 + 3 -----(2)Comparing (1) and (2), √3 + 3 = √3 + √9 Apart from the stuff given above, if you need any other stuff in math, please use our google custom search here. Kindly mail your feedback to v4formath@gmail.comWe always appreciate your feedback. ©All rights reserved. onlinemath4all.com For each pair of numbers, decide which is greater without using a calculator. Explain your choices. π^2 or 9 $ \sqrt{50}$ or $\sqrt{51}$ $\sqrt{50}$ or 8 -2π or -6 This task can be used to either build or assess initial understandings related to rational approximations of irrational numbers. The Standards for Mathematical Practice focus on the nature of the learning experiences by attending to the thinking processes and habits of mind that students need to develop in order to attain a deep and flexible understanding of mathematics. Certain tasks lend themselves to the demonstration of specific practices by students. The practices that are observable during exploration of a task depend on how instruction unfolds in the classroom. While it is possible that tasks may be connected to several practices, only one practice connection will be discussed in depth. Possible secondary practice connections may be discussed but not in the same degree of detail. This task allows students to construct viable arguments by identifying and justifying the greater of two expressions in each part. As students reason through determining which amount is greater, they will use “previously established results,” their knowledge of products, squares, and square roots of benchmark numbers, to reason about slightly larger or smaller numbers. In order to identify a greater expression without making an exact numerical calculation, students will build a logical progression of statements, starting with previous knowledge, and building from there. Students might reason, “I know that three squared is nine, and pi is slightly larger than three, therefore pi squared should be slightly larger than 9.” The teacher could have students individually solve each of the problems and then discuss their solutions in small group to promote collaboration and refinement of their solutions. They would then verbalize their final answers in large group defending or again refining their answers. The teacher could promote the development of number sense and further get to the meaning of the standard by posing questions such as “How would these comparisons look on a number line?” This approach of reasoning about quantities without making exact calculations ties to MP.7, Look for and make use of structure. This is also a prime opportunity for the teacher to make sure that students address MP.6 and use clear and precise language when justifying their conclusions. $\pi \gt 3$ so $\pi^2 \gt 9$. $ \sqrt{50} \lt \sqrt{51}$ because $50 = (\sqrt{50})^2 \lt (\sqrt{51})^2 = 51.$ $7^2 = 49$ and $8^2 = 64$. Thus we have that $\sqrt{49} \lt \sqrt{50} \lt \sqrt{64}$. So $\sqrt{50} \lt 8$. $\pi \gt 3$ so $2\pi \gt 2\cdot3$. If you look at these numbers on the number line, that means that 2π is farther to the right than 6. When you look at their opposites, -2π will be farther to the left than -6, so $-2\pi \lt -6$. Page 2 Standard Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. RESOURCES BY STANDARD AI GEO AII PLUS or www.commoncorestatestandards.org RESOURCES BY TOPIC AI GEO AII PRECALCULUS CALCULUS QUICK TOPICS REGENTS EXAMS WORKSHEETS JMAP ON JUMBLED An online platform for the above Algebra I resources REGENTS BOOKS AI LESSON PLANS WORKSHEET GENERATORS EXTRAS REGENTS EXAM ARCHIVES 1866-now JMAP RESOURCE ARCHIVES AI/GEO/AII (2015-now) IA/GE/A2 (2007-17) Math A/B (1998-2010) REGENTS RESOURCES INTERDISCIPLINARY EXAMS NYC TEACHER RESOURCES If you're seeing this message, it means we're having trouble loading external resources on our website. If you're behind a web filter, please make sure that the domains *.kastatic.org and *.kasandbox.org are unblocked. As we know that the numbers which can’t be written in \(\frac{p}{q}\) form or fraction form are known as irrational numbers. These are non- recurring decimal numbers. The square roots, cute roots of numbers which are not perfect roots are examples of irrational numbers. In such cases in which perfect square roots or cube roots can’t be found out, it is difficult to compare them without knowing their approximate or actual value.For comparing them, we should always keep in mind that if square or cube roots of two numbers (‘a’ and ‘b’) are to be compared, such that ‘a’ is greater than ‘b’, then a\(^{2}\) will be greater than b\(^{2}\) and a\(^{3}\) will be greater than b\(^{3}\) and so on, i.e., nth power of ‘a’ will be greater than nth power of ‘b’. 1. Compare \(\sqrt{2}\) and \(\sqrt{3}\)Solution: We know that if ‘a’ and ‘b’ are two numbers such that ‘a’ is greater than ‘b’, then a\(^{2}\) will be greater than b\(^{2}\). Hence, for \(\sqrt{2}\) and \(\sqrt{3}\), let us square both the numbers and then compare them:\((\sqrt{2})^{2}\) = \(\sqrt{2}\) × \(\sqrt{2}\) = 2,\((\sqrt{3})^{2}\) = \(\sqrt{3}\) × \(\sqrt{3}\) = 3Since, 2 is less than 3. Hence, \(\sqrt{2}\) will be less than \(\sqrt{3}\).2. Compare \(\sqrt{17}\) and \(\sqrt{15}\).Solution:Let us find out the square of both the numbers and then compare them. So,\((\sqrt{17})^{2}\) = \(\sqrt{17}\) × \(\sqrt{17}\) = 17,\((\sqrt{15})^{2}\) = \(\sqrt{15}\) × \(\sqrt{15}\) = 15Since, 17 is greater than 15. So, \(\sqrt{17}\) will be greater than \(\sqrt{15}\).3. Compare 2\(\sqrt{3}\) and \(\sqrt{5}\).Solution:To compare the given numbers let us first find the square of both the numbers and then carry out the comparison process. So,\(2(\sqrt{3})^{2}\) = 2\(\sqrt{3}\) x 2\(\sqrt{3}\) = 2 × 2 × \(\sqrt{3}\) × \(\sqrt{3}\) = 4 × 3 = 12,\((\sqrt{5})^{2}\) = \(\sqrt{5}\) × \(\sqrt{5}\) = 5Since, 12 is greater than 5. So, 2\(\sqrt{3}\) is greater than \(\sqrt{5}\).4. Arrange the following in ascending order:\(\sqrt{5}\), \(\sqrt{3}\), \(\sqrt{11}\), \(\sqrt{21}\), \(\sqrt{13}\).Solution: Arranging in ascending order stands for arrangement of series from smaller value to the larger value. To arrange the given series in ascending order let us find the square of every element of the series. So, \((\sqrt{5})^{2}\) = \(\sqrt{5}\) × \(\sqrt{5}\) = 5.\((\sqrt{3})^{2}\) = \(\sqrt{3}\) × \(\sqrt{3}\) = 3.\((\sqrt{11})^{2}\) = \(\sqrt{11}\) × \(\sqrt{11}\) = 11.\((\sqrt{21})^{2}\) = \(\sqrt{21}\) × \(\sqrt{21}\) = 21.\((\sqrt{13})^{2}\) = \(\sqrt{13}\) × \(\sqrt{13}\) = 13.Since, 3 < 5 < 11 < 13 < 21. Hence, the required order of the series is:\(\sqrt{3}\) < \(\sqrt{5}\) < \(\sqrt{11}\) < \(\sqrt{13}\) < \(\sqrt{21}\).5. Arrange the following in descending order:\(\sqrt[3]{5}\), \(\sqrt[3]{7}\), \(\sqrt[3]{15}\), \(\sqrt[3]{2}\), \(\sqrt[3]{39}\).Solution:Descending order stands for arrangement of given series in larger value to the smaller value. To find the required series, let us find the cube of each element of the series. So,\((\sqrt[3]{5})^{3}\) = \(\sqrt[3]{5}\) × \(\sqrt[3]{5}\) × \(\sqrt[3]{5}\) = 5.\((\sqrt[3]{7})^{3}\) = \(\sqrt[3]{7}\) × \(\sqrt[3]{7}\) × \(\sqrt[3]{7}\) = 7.\((\sqrt[3]{15})^{3}\) = \(\sqrt[3]{15}\) × \(\sqrt[3]{15}\) × \(\sqrt[3]{15}\) = 15.\((\sqrt[3]{2})^{3}\) = \(\sqrt[3]{2}\) × \(\sqrt[3]{2}\) x \(\sqrt[3]{2}\) = 2.\((\sqrt[3]{39})^{3}\) = \(\sqrt[3]{39}\) × \(\sqrt[3]{39}\) × \(\sqrt[3]{39}\) = 39.Since, 39 > 15 > 7 > 5 > 2. So, the required order of the series is:\(\sqrt[3]{39}\) > \(\sqrt[3]{15}\) > \(\sqrt[3]{7}\) > \(\sqrt[3]{5}\) > \(\sqrt[3]{2}\) Irrational NumbersDefinition of Irrational NumbersRepresentation of Irrational Numbers on The Number LineComparison between Two Irrational NumbersComparison between Rational and Irrational NumbersRationalizationProblems on Irrational NumbersProblems on Rationalizing the DenominatorWorksheet on Irrational Numbers 9th Grade MathFrom Comparison between Two Irrational Numbers to HOME PAGE Didn't find what you were looking for? Or want to know more information about Math Only Math. Use this Google Search to find what you need. Share this page: What’s this?

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