**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Has Grit           Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_**

**Analytic Geometry for College Graduates Day 38 CW/HW**

**Unit 4: Extending the Number System | Topic:** Classifying Rational and Irrational Numbers

|  |  |
| --- | --- |
| **Rational Numbers** | **Irrational Numbers** |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ decimal***Examples*$$\frac{7}{8}=$$$$\frac{123}{1000}=$$ | **Non-\_\_\_\_\_\_\_\_\_\_\_\_\_,****Non-\_\_\_\_\_\_\_\_\_\_\_\_\_ decimal, or****Non-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ radicals***Examples*$$π$$$$\sqrt{8}$$$$\frac{\sqrt{3}}{4}$$$$\sqrt{8}+\sqrt{2}$$ |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ decimal***Examples*$$\frac{2}{3}=$$$$\frac{123}{999}=$$ |
| **Radicals with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***Examples*$$\left(8+\sqrt{2}\right)\left(8-\sqrt{2}\right)=$$$$\frac{\sqrt{8}}{\sqrt{2}}=$$$\sqrt{3}∙\sqrt{12}$ **=**$$4\sqrt{2}-2\sqrt{8}=$$ |

**Is It Rational?**

**For each of the numbers below, decide whether it is rational or irrational. Explain your reasoning in detail.**

|  |  |
| --- | --- |
| **Rational or Irrational?** | **Detailed reason why:** |
| **1. 5** |  |
| **2.** $\left(5+\sqrt{5}\right)\left(5-\sqrt{5}\right)$ |  |
| **3. 0.575** |  |
| **4.** $\sqrt{5}$ |  |
| **5.** $5+\sqrt{7}$ |  |
| **6.** $\frac{\sqrt{10}}{2}$ |  |
| **7.** $5.\overbar{75}$ |  |
| **8.** $\frac{5}{7}$ |  |
| **9.** $\left(7+\sqrt{5}\right)\left(5-\sqrt{5}\right)$ |  |

**In the right-hand column, write whether you agree or disagree with each student’s statement.**

|  |  |
| --- | --- |
| 11. Rihanna says “$0.\overbar{57}$ is an irrational number” |  |
| 12. Beyonce says, “No, Rihanna, it is rational because $0.\overbar{57}$ can be written as a fraction.” |  |
| 12. Jay-Z says, “Maybe Beyonce’s correct, you know. Because $0.\overbar{57}= \frac{57}{100}$ |  |
| 13. Kanye says, “Hang on, I’mma let you finish but the decimal $0.\overbar{57}$ would go on forever if you tried to write it. That’s what the bar thing means, right?” |  |
| 14. Drake says, “And because it goes on forever, that proves that $0.\overbar{57}$ has got to be irrational.  |  |