8.NS.A

Know that there are numbers that are not rational, and approximate them by rational numbers.

1. Determine for each expression whether it represents a rational number or an irrational number.

| **Number** | **Rational** | **Irrational** |
| --- | --- | --- |
| 3.5 $×$ 10–3 |  |  |
| $$\frac{\sqrt{81}}{5}$$ |  |  |
|  (3$π$)2 |  |  |
| $$7\sqrt{2}$$ |  |  |

1. Which interval contains the value of $7\sqrt{5} -2\sqrt{5}$?

A. between 4 to 5
B. between 5 to 6
C. between 11 to 12
D. between 15 to 16
2. Order these four expressions from least value to greatest value.

10 $π$2 1.34 $×$ 102 90 $\sqrt{7024}$
3. Write the repeating decimal $0.8\overbar{2}$ as a fraction. Use only whole numbers for the numerator and denominator.
4. Marvin knows the formula for the area of a circle is *A* = $π$*r*2. He claims that because $π$ is an irrational number, the area of all circles are irrational. Do you agree or disagree with Marvin’s claim? If you agree, explain why. If you disagree, provide a counterexample.
5. Plot a point on the number line to approximate the value of $3\sqrt{7}$ to the nearest tenth.


6. Write the fraction $\frac{16}{30}$ as a decimal.

**Teacher Material**

8.NS.A

Know that there are numbers that are not rational, and approximate them by rational numbers.

| **Question** | **Claim** | **Key/Suggested Rubric** |
| --- | --- | --- |
| 1[[1]](#footnote-1) | 1 | **1 point:**

| **Number** | **Rational** | **Irrational** |
| --- | --- | --- |
| 3.5 $×$ 10–3 | **x** |  |
| $$\frac{\sqrt{81}}{5}$$ | **x** |  |
| (3$π$)2 |  | **x** |
| $$7\sqrt{2}$$ |  | **x** |

 |
| 21 | 1 | **1 point:** Selects C |
| 3[[2]](#footnote-2) | 1 | **1 point:** Orders$\sqrt{7024}$, 90, 10 $π$2, 1.34 $×$ 102 |
| 41 | 1 | **1 point:** $\frac{74}{90}$, or equivalent fraction |
| 52 | 3 | **1 point:** Provides an explanation for agreeing OR a counterexample for disagreeing. Example 1: I agree because when the radius is any rational number, then the radius squared is also a rational number. And a rational number time $π$ is an irrational number. Example 2: I disagree because when the radius is $\frac{4}{\sqrt{π}}$, then the area of the circle is 16, which is rational. |
| 61 | 1 | **1 point:** A number line from 7 to 9. Increments of tenths are shown, with the intervals 7, 7.5, 8, 8.5, and 9 labeled. A point is plotted at 7.9. |
| 72 | 1 | **1 point:** $0.21\overbar{6}$ |

1. From Smarterbalanced.org. Grade 8, Claim 1, Target A Item Specifications. Internet. Available from <http://www.smarterbalanced.org/smarter-balanced-assessments/>; accessed 11/2015. [↑](#footnote-ref-1)
2. Adapted from the Mathematics K–12 Learning Standards. Internet. Available from <http://www.k12.wa.us/Mathematics/Standards.aspx>; accessed 11/2015. [↑](#footnote-ref-2)