

Assessment Title: Operations on Rational and Irrational Numbers

Unit 1: Extending the Number System

Learning Targets:

- I can make decisions about the results of adding and multiplying combinations of rational and irrational numbers

Part I: Identify each number as *rational* or *irrational*.

1. $3^{1/2}$

5. π

2. $16^{2/4}$

6. e

3. $-8^{1/3}$

7. $(-2)^{8/2}$

4. 10

8. $0.\overline{45}$

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Part II: Evaluate the given expression. Then identify the final answer as *rational (R)* or *irrational (I)*.

Ex. $1 + 2 = 3$

$R + R = R$

9. $10 + 16^{2/4} = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

13. $e * 10 = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} * \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

10. $-8^{1/3} * 0.\overline{45} = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} * \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

14. $0.\overline{45} * 10 = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} * \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

11. $16^{2/4} + e = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

15. $(-2)^{8/2} + 3^{1/2} = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

12. $10 * 16^{2/4} = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} * \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

16. $-8^{1/3} + \pi = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$

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Part III: Draw a conclusion about each operation and explain your reasoning, if (*R*) stands for rational number and (*I*) stands for irrational number.

17. $R + R =$ _____

Explain:

18. $R * R =$ _____

Explain:

19. $R + I =$ _____

Explain:

20. $R * I =$ _____

Explain:

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Part III: Use the conclusions you have drawn above to answer the following questions.

21. If $5x = y$ and y is *irrational*, what values of x would make the equation true?

22. If $\pi x = y$ and y is *irrational*, what values of x would make this equation true?

23. Can you make any generalization(s) about either $I + I$ or $* I$? Provide specific examples to explain.

Rational and Irrational Numbers

Use properties of rational and irrational numbers.

- **N.RN.3** Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Problem #/Grading Notes	Points Possible	Points Assigned
#1-8 Rational vs. Irrational. Right or Wrong 1 point each.	8	
#9-16 Students should provide a correct evaluation (1 point) and correct symbolism (1 point).	16	
#17-20 Students will be drawing conclusions on each given scenario. They will fill in the blank correctly (1 point) and then explain/support their decision with a specific example (hopefully from the items in #9-16). (1 point)	8	
#21-22 Students must correctly identify for x using theorems from #17-20. (2 points)	4	
#23 Provide conclusions about each of the proposed items along with evidence to support the conclusion. (2 points for the addition and 2 points for the multiplication).	4	
	Total: 40	