Additional Problems: Rational & Irrational Numbers

**Sums & Products of Rational Numbers**

1. Without solving, will the product of √64 and 2/5 be rational or irrational?
2. Without solving, will the product of √81 and 3/7 be rational or irrational? Justify your answer.
3. John has 3/4 of a pizza and Jane has 2/3 of a pizza. If they combine their pizzas, what fraction of a whole pizza will they have? Is the result a rational number?
4. A rational number can be expressed as the ratio of two integers, where the denominator is not zero. Given the rational numbers 5/6 and 7/8, find their sum and express it as a ratio of two integers. Prove that the result is a rational number.
5. The sum of two rational numbers can be found by finding a common denominator and then adding the numerators. Given the rational numbers 2/3 and 4/5, find their sum by finding a common denominator. Prove that the result is a rational number.
6. Evaluate the expression 2/5 + √16. Is the result a rational or irrational number?
7. Find the value of the expression 3/7 + √25. Is the result a rational or irrational number? Justify your answer.
8. Calculate the value of the expression 4/9 + √36. Is the result a rational or irrational number?
9. The product of two rational numbers can be found by multiplying their numerators and denominators. Given the rational numbers 3/5 and 4/7, find their product by multiplying their numerators and denominators. Prove that the result is a rational number.
10. A rational number can be expressed as the ratio of two integers, where the denominator is not zero. Given the rational numbers 3/4 and 5/6, find their sum and product. Use the closure property to prove that both results are rational numbers.