

1.5 Rational Vs. Irrational Numbers

Geometry

Directions: Identify each number as rational or irrational.

- | | |
|-------------------------|--------------------------|
| 1. 4.101010001... _____ | 2. $-0.33333...$ _____ |
| 3. 4π _____ | 4. $\frac{3}{4}$ _____ |
| 5. $\sqrt{256}$ _____ | 6. $\sqrt{216}$ _____ |
| 7. $\sqrt{440}$ _____ | 8. $(3\sqrt{5})^2$ _____ |

Directions: Are the following sums, differences, and products rational or irrational?

- | | |
|---|-----------------------------------|
| 9. $\sqrt{13} * \sqrt{13}$ _____ | 10. $\sqrt{49} + \sqrt{25}$ _____ |
| 11. $3\pi - \pi$ _____ | 12. $\sqrt{50} * \sqrt{40}$ _____ |
| 13. $\sqrt{\frac{14}{5}} * \sqrt{\frac{10}{7}}$ _____ | 13. $5(3\pi - 6) - 15\pi$ _____ |

Directions: Circle the best answer for each multiple choice question below.

14. Which number can you add to any rational number to obtain an irrational number?

- A) 3.453 B) $\sqrt{16}$ C) $79\frac{12}{17}$ D) $\sqrt{8}$

15. Let a be a rational number and b be an irrational number

$a + b = c$, assume c is rational
 $a + b - a = c - a$, subtract a from both sides
 $b = c - a$, which means that b is rational. But this contradicts the initial assumption

The above proof shows that the sum of a rational and an irrational number is _____.
Explain.

- A) rational. Since an irrational number cannot equal a rational number.
B) irrational. Since an irrational number cannot equal a rational number.
C) rational. Since you can write it as the subtraction of two rational numbers.
D) irrational. Since you can write it as the subtraction of two rational numbers.

Directions: Simplify completely.

16) $\sqrt{12x} + (5\sqrt{2})^2 - 2\sqrt{3x}$

17) $\frac{4}{1-\sqrt{2}}$

18) $12\sqrt{72} * -6\sqrt{32}$

19) $5\sqrt[3]{2048} - \frac{\sqrt{34}}{\sqrt{18}}$

20) $\sqrt{\frac{17x}{12x^2}}$

21) $12\sqrt{112y^4} (\sqrt{14y}) - \sqrt{32}$

22) The volume of a rectangular prism is $2520\sqrt{5}$ units³. If the base has a width of $5\sqrt{3}$ units and a length of $7\sqrt{6}$ units, what is the height of the prism?

23) A rectangle with an area of $10\sqrt{33}$ m², has a side length of $5\sqrt{22}$ m. What is the perimeter of this rectangle?