Rational Vs. Irrational Numbers

Algebra

Directions: Identify each number as rational or irrational.

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

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

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

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. Label the following statements as true or false.

A) The product of two rational numbers is always rational. T

B) The sum of two irrational numbers is always irrational. F

C) The product of two rational numbers is always irrational. F

D) The product of two irrational numbers is never irrational. F

E) The sum of two rational numbers is always irrational. F

F) The sum of a rational and irrational number is rational. F

G) The product of a nonzero rational number and an irrational number is always rational. F

16) A rectangle with an area of $10\sqrt{33}$ m^2, has a side length of $5\sqrt{22}$ m. What is the other side of this rectangle?

$\sqrt{6}$

17) What is the perimeter from #16?

$10\sqrt{22} + 2\sqrt{6}$

18) If a square has a perimeter of $20\sqrt{3}$ units, what is the area of the square?

$\frac{20\sqrt{3}}{4} = 5\sqrt{3} \cdot 5\sqrt{3} = \boxed{75}$

19) If a square has an area of 72 units^2, what is the perimeter of the square?

$6\sqrt{2} * 4 = 24\sqrt{2}$

20) Solve for x. $3\sqrt{7} \cdot x + \sqrt{5} = 2\sqrt{5}$

$\frac{\sqrt{35}}{21}$