

Rational or Irrational

Determine if the number is rational (R) or irrational (I).

1) 61π

2) 42

3) $75.082\overline{106}$

4) $\sqrt{101}$

5) $65.42\overline{79}$

6) $\frac{20}{6}$

7) π

8) $5.62\overline{13}$

9) $\frac{98}{16}$

10) 39

11) $89.396668\overline{\dots}$

Verbal Expressions

15) the quotient of a number and 6

16) v squared

17) t more than 9

18) 3 cubed

19) the quotient of 24 and 8

20) the sum of 2 and 12

21) p cubed

22) the product of 5 and x

23) 2 to the 4th

24) twice 11

Write each algebraic expression as a variable expression

1) $2n$

3) $3n + 4$

2) n^2

4) $4(n-2)$

Simplifying Radical Expressions

Simplify.

1) $\sqrt{125n}$

2) $\sqrt{216v}$

3) $\sqrt{512k^2}$

4) $\sqrt{512m^3}$

5) $\sqrt{216k^4}$

6) $\sqrt{100v^3}$

Adding and Subtracting Radicals

$$17) 3\sqrt{18} - 2\sqrt{2}$$

$$18) -3\sqrt{18} + 3\sqrt{8} - \sqrt{24}$$

$$19) 3\sqrt{18} + 3\sqrt{12} + 2\sqrt{27}$$

$$20) -3\sqrt{5} - \sqrt{6} - \sqrt{5}$$

$$21) -3\sqrt{2} + 3\sqrt{20} - 3\sqrt{8}$$

$$22) -3\sqrt{3} - \sqrt{8} - 3\sqrt{3}$$

Multiplying Radicals

$$7) \sqrt{15n^2} \cdot \sqrt{10n^3}$$

$$8) \sqrt{18a^2} \cdot 4\sqrt{3a^2}$$

$$9) -3\sqrt{7r^3} \cdot 6\sqrt{7r^2}$$

$$10) -4\sqrt{28x} \cdot \sqrt{7x^3}$$

$$11) \sqrt{3}(5 + \sqrt{3})$$

$$12) 2\sqrt{5}(\sqrt{6} + 2)$$

Adding and Subtracting Polynomials

Simplify each expression.

1) $(5p^2 - 3) + (2p^2 - 3p^3)$

2) $(a^3 - 2a^2) - (3a^2 - 4a^3)$

5) $(3a^2 + 1) - (4 + 2a^2)$

6) $(4r^3 + 3r^4) - (r^4 - 5r^3)$

9) $(-4k^4 + 14 + 3k^2) + (-3k^4 - 14k^2 - 8)$

10) $(3 - 6n^5 - 8n^4) - (-6n^4 - 3n - 8n^5)$

Multiplying Polynomials

15) $(6n + 3)(6n - 4)$

16) $(8n + 1)(6n - 3)$

17) $(6k + 5)(5k + 5)$

18) $(3x - 4)(4x + 3)$

19) $(4a + 2)(6a^2 - a + 2)$

20) $(7k - 3)(k^2 - 2k + 7)$

Practice with Word Problems and Polynomials

1. A triangle has three sides with the following lengths: $2x + 1$ units, $3x + 5$ units, and $4x - 1$ units. Write a simplified algebraic expression for the **perimeter** of the triangle.
2. An octagon has sides that all have a length of y . Write a simplified algebraic expression for the **perimeter** of the octagon in terms of y .
3. A square has an unknown length and width. If its length is increased by 11 units to create a new, larger rectangle, write a simplified algebraic expression for the **area** of the new rectangle in terms of a if a represents the length of the original square.
4. The width of a rectangle is unknown. The length of the rectangle is two more units than its width. Write a simplified algebraic expression for the **area** of the rectangle in terms of width (w).
5. The formula for the area of a triangle is $\text{Area} = \frac{1}{2} \bullet \text{base} \bullet \text{height}$. If the base of a triangle has a length of $8x$ units, and the height is $x + 6$ units, write a simplified algebraic expression for the **area** of the triangle in terms of x .

Miscellaneous

1. How many terms are in the simplified expression:

$$35x^3 + 10x^2 - 3x - 17x^2 + 2x + 129$$

What is the degree of this expression?

What is the leading co-efficient of this polynomial?

2. Write the following as an algebraic expression.

- X decreased by 10 plus y squared
- X times 10 plus 2 y
- 10 less than x cubed
- 6 times the sum of n and 8
- 6 times n increased by 8

3. Fill in the blank

- One term is called a _____.
- Two terms are called a _____.
- Three terms are called a _____.
- Many terms are called _____.