

Math 161
Basic Concepts of Algebra Worksheet

Write in interval notation:

1. $\{x \mid x \leq \sqrt{25}\}$

List the rational numbers:

2. $5, -\sqrt{2}, \frac{1}{3}, \sqrt{-16}, \pi, \sqrt{36}, 3.14$

Simplify. Write answer with positive exponents:

3. $(-4x^{-3}y^2)^{-2}(2x^4y)$

Evaluate and write answer in standard form:

4. $(2.3 \times 10^{-5}) \div (4.3 \times 10^{-2})$

Calculate:

5. $\frac{(4^3 - 12 * 2) - (3)^{-1}(-9)}{2^2(2^0 + 5)}$

6. Suppose that \$4803 is invested at 5.6%, compounded quarterly. How much is in the account at the end of 7 years?

Perform the operation and simplify:

7. $(4x^2y + 7xy - 3y^2 + 9) - (-2xy + 3x^2y - 5y^2 + 3)$

8. $(a - b)(2a^3 - 2a + 5ab^2 + 2)$

9. $(y - 3)(y + 3)(y + 4)^2$

Factor:

10. $x^3 - 9x - 2x^2 + 18$

11. $21x^2y + 2xy - 8y$

12. $4x^3 + 108$

13. $3x^6 - 27y^4$

Simplify:

$$14. \frac{(y^2 - y - 12)}{(y^2 - 6y + 8)} \cdot \frac{(y^2 + y - 6)}{(y^2 - 2y - 24)}$$

$$15. \frac{3x}{3x - 2y} - \frac{2x}{2y - 3x}$$

$$16. \frac{y-1}{y-2} - \frac{y+1}{y+2} - \frac{y-6}{4-y^2}$$

$$17. \frac{\frac{1-a}{a} + \frac{a}{1+a}}{\frac{1+a}{a} + \frac{a}{1-a}}$$

$$18. \sqrt[3]{\frac{128x^4}{16x}}$$

$$19. \frac{x^{2/3}}{(4b^{-2})^{1/2}}$$

Rationalize:

$$20. \frac{(9 - \sqrt{6})}{(3 + \sqrt{3})}$$

Solve:

$$21. 10y^2 - 16y + 6 = 0$$

$$22. 3x^3 - 5x^2 = 2x$$

$$23. (y+1)^3 = y^3 + 1$$