

**Algebra II Unit 4A** Rational Expressions/Equations/Inequalities Review

**Simplify each expression.**

1.  $\frac{x^2 - y^2}{x + y}$

2.  $\frac{2x^3 - 18x}{x + 3}$

3.  $\frac{x^2 - 2x - 15}{x^2 - 4} \cdot \frac{x^2 - x - 2}{x^2 - 9}$

4.  $\frac{a^3 + 4a}{a^2 - 16} \div \frac{a^2 + 8a + 15}{a^2 + a - 20}$

5.  $\frac{x}{x - y} - \frac{2x}{x^2 - y^2}$

6.  $\frac{3a}{4a - 20} + \frac{9a}{6a - 30}$

7.  $\frac{2x + 1}{x^2 + 2x - 15} - \frac{x}{x^2 + x - 20}$

8.  $\frac{c}{c + 1} - \frac{4}{c + 4} + \frac{3}{c^2 + 5c + 4}$

9.  $\frac{\frac{x^2 - 16}{x - 3}}{\frac{2x^2 + 5x - 12}{x^2 - 9}}$

**Solve each equation.**

10.  $\frac{2}{x - 3} = \frac{5}{x + 6}$

11.  $\frac{1}{x} = \frac{x - 3}{40}$

12.  $\frac{n^2 - n - 6}{n^2} - \frac{2n + 12}{n} = \frac{n - 6}{2n}$

13.  $\frac{1}{2} + \frac{12}{x} = \frac{x}{4}$

$$14. \frac{3}{x-8} - \frac{4}{x-2} = \frac{28}{x^2 - 10x + 16}$$

$$15. -16x^2 + 96x + 256 > 0$$

$$16. \frac{2x-7}{x-4} - 1 \leq 0$$

$$17. \frac{5}{x+3} \geq \frac{4}{x+2}$$

18. Jason can clean a large tank at an aquarium in about 6 hours. When Jason and Lacy work together, they can clean the tank in about 3.5 hours. About how long would it take Lacy to clean the tank if she works by herself?

19. Julien can mulch a garden in 20 minutes. Remy can mulch the same garden in 24 mins. If Julien and Remy mulched the same garden together, how long would it take them?

20. Sarah takes twice as long as Susan to make the display case at school. Together it takes 6 hours to do the display case. How long does it take Sarah to do it by herself.

21. The ratio of 3 less than a number to 25 more than that number is 1 to 3. What is the number?

22. A car travels 300 km in the same time that a freight train travels 200 km. The speed of the car is 20km/h more than the speed of the train. Find the speed of the car and the speed of the train.