Intermediate Algebra Common Final Sample #3

1. Solve: $3 - 2(x + 1) = 5[2 - (x + 3)]$

2. Simplify. Write your answer with positive exponents. $\left(\dfrac{-2pq^5r^{-2}}{3p^{-2}q^3r^2}\right)^{-4}$

3. Divide using Synthetic Division. $\dfrac{3x^3 - 2x^2 + x}{x+3}$

4. Solve. $2 = \sqrt{x+4} + \sqrt{2x}$

5. Graph the solution to the system on inequalities: $\begin{cases} 3x - y \geq 4 \\ x + y < 4 \\ y > -3 \end{cases}$

6. How many pints of a 10% antifreeze solution and how many pints of a 40% antifreeze solution must be mixed to obtain 24 pints of a 30% solution?

7. Graph $x = y^2 - 4y + 7$

8. Given an arithmetic sequence with $a_4 = 2$ and $a_{20} = -46$, find a_{50} and S_{50}.

9. Solve $2|x + 3| - 4 = 6$

10. Rationalize. $\sqrt[3]{\dfrac{2}{3x^2}}$

11. Use Cramer's Rule to solve for **y**. $\begin{cases} 4x - 3y = 1 \\ 6x - 8z = 1 \\ 2y - 4z = 0 \end{cases}$

12. Simplify. $\dfrac{2x^2 - x - 3}{8x^2 + 20x + 12} \div \dfrac{2x^2 - 3x}{16x^4 + 54x}$

13. Given $f(x) = 3x^2 - 1$. Find and simplify the difference quotient $\dfrac{f(x+h) - f(x)}{h}$

14. Solve. $\log_2(x^2 - 4x) = \log_2(4 - x) + 3$

15. An initial deposit of $10,000 earns 8% interest compounded quarterly. How long will it take to double? (Round to the nearest tenth.)

16. Use the Binomial Theorem to expand $(2x - 1)^5$. Simplify all terms.

17. Find the equation of a line passing through the point (1,-5) that is perpendicular to the line $4x = -3y + 15$. Write your answer in slope-intercept form.

18. Solve. Write your answer in interval notation. $3x^2 - 11x - 4 \geq 0$

19. Working together, a chef and his assistant can make a pastry dessert in 25 minutes. When the chef makes it himself, it takes him 8 minutes less time than it takes his assistant working alone. How long does it take the chef to make to dessert? Round to the nearest minute.

20. Find the sum of the infinite geometric series: $3 - 2 + \frac{4}{3} - \frac{8}{9} + \cdots$

21. Solve. $\frac{x-4}{x-3} - \frac{x-2}{3-x} = x - 3$

22. Graph $4x^2 + 9y^2 + 24x - 18y + 9 = 0$

23. Find **all** solutions. $4x^4 - 3x^2 = 1$

24. A woman invested money in two accounts. One paying 5% annual simple interest and $3,000 less than that in an account paying 4.25% annual simple interest. If she earned $797.50 interest in one year, how much did she invest in each account?

25. Given $f(x) = 3 - 2x^2$ and $g(x) = x + 5$, find and simplify $(f \circ g)(x)$.

26. Solve. Write your answer in interval notation. $|3x - 1| \geq 4$

27. Simplify the complex fraction. $\dfrac{1 - \frac{16}{x^2}}{\frac{12}{x} + 3}$