

Intermediate Algebra Common Final Sample #2

1. Simplify $(27x^6y^9z^{-21})^{\frac{1}{3}}$ completely. Write your answer using positive exponents only.

2. For the following one-to-one function, find the equation of the inverse: $f(x) = \frac{3}{x^3} - 1$

3. Simplify: $\frac{\frac{1}{x^2 - 3x + 2}}{\frac{3}{x - 2} - \frac{2}{x - 1}}$

4. Solve the inequality and write the solution in interval notation: $0 \leq |6x - 3| - 5$

5. Solve: $\sqrt{x} + \sqrt{x + 2} = 2$

6. Find the 15th term of the **arithmetic** sequence: $\frac{1}{2}, \frac{1}{4}, 0, \dots$

7. Solve the following and graph the solution set on the number line: $\frac{x - 2}{2x + 3} \geq 0$

8. Graph the following: $(x + 5)^2 - 4y^2 = 16$

9. If \$1,300 is deposited in a savings account paying 9% interest, compounded quarterly, how long will it take the account to increase to \$3,900? Round to the nearest tenth of a year.

10. Factor completely: $a^4b^2 - 20a^2b^2 + 64b^2$

11. Find the equation of a line that passes through $(-18, -54)$ that is perpendicular to $x + 3y = 12$.

12. Using Cramer's Rule, find y ONLY.

$$4x + y + z = -1$$

$$2x + 3y + 4z = 0$$

$$-x + y + 2z = 0$$

13. Graph $f(x) = -6x^2 - 12x - 8$

14. It takes a total of 6 hours for a boater to travel 16 miles upstream and 16 miles back. If the speed of the boat in still water is 6 mph, what is the speed of the current?

15. Find all solutions: $3x^2 + 2 = 4x$

16. Rationalize the denominator: $\frac{\sqrt{x} + \sqrt{y}}{\sqrt{x} - \sqrt{y}}$

17. Solve for R : $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$

18. A golf ball is dropped from a height of 12 feet. On each bounce, it returns to a height that is two-thirds of the distance it fell. Find the total vertical distance the ball travels.

19. Divide $1 - 4x + 7x^2 + 3x^3$ by $x + 3$ using synthetic or long division.

20. Expand $(2x - 1)^4$. Simplify all terms.

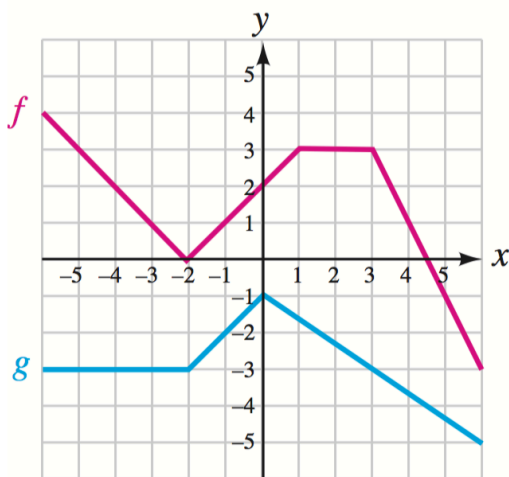
21. A total of \$10,000 is invested in two accounts, one paying 5% annual interest and the other 6%. If the interest earned for the first year was \$540, how much did she invest in the account paying 5%?

22. Simplify: $\frac{x^3 - 3x^2 - 25x + 75}{x^3 - 27} \cdot \frac{2x^3 + 6x^2 + 18x}{x^2 + 10x + 25}$

23. Given $f(x) = x^2 - 2x - 1$, find and simplify the difference quotient, $\frac{f(x+h) - f(x)}{h}$

24. Solve the equation: $2 \log x - \log(x+6) = 0$

25. Use the graphs provided to find $(f \circ g)(3)$.



26. Find the center of the circle $x^2 + y^2 - 2x + 4y = -1$. Write your answer as an ordered pair.