Algebra 2b
Final Review

Name_____

1. Simplify $\sqrt{6x}\cdot\sqrt{12x^5}$

2. Write the expression $3^{\frac{2}{3}}$ in radical form.

3. Simplify $3\sqrt[3]{16}-2\sqrt[3]{81}$

4. Simplify $\left(x^{\frac{2}{3}}\right)^{\frac{3}{2}}$

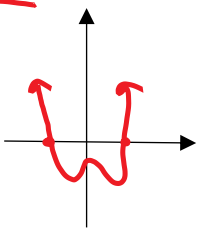
5. Simplify $\sqrt[5]{32x^{10}}$

6. Simplify $\frac{8}{2\sqrt{5}}$

7. Solve $\sqrt{2x+7}=15$

8. If f(x)=3x+2 and g(x)=2x²+4, find $(g\circ f)(1)$

9. Sketch an even degree function with a positive leading coefficient. The function should have 2 real zeroes, 1 relative maximum, and 2 relative minimums.



10. Write the function in factored form, then find the zeroes: f(x) = x⁴-15x³

11. Divide $\left(x^3+7x^2+15x+9\right)\div\left(x+1\right)$

12. Use synthetic division and the given factor to completely factor.

$y=x^3-4x^2-9x+36$; $(x+3)$

13. Find the zeroes of the function.

y=x³-2x²-3x+6

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14. Determine an equation for the cubic function that is obtained from the parent function $y=x^3$ after a vertical translation of 5 units up.

$y = x^3 + 5$

15. Write a polynomial function with rational coefficients so that P(x)=0 has the given roots: -4, 3i

$ax^3+bx^2+cx+d=0$

$x=-4 \quad x=3i \quad x=-3i$

$(x+4)(x-3i)(x+3i)=0$

$(x+4)(x^2+3ix-3ix-9i^2)=0$

$(x+4)(x^2-9(-1))=0$

$(x+4)(x^2+9)=0$

$x^3+9x+4x^2+36=0$

$x^3+4x^2+9x+36=0$

16. Solve $\log_4 64 = x$

$\frac{(\log 64)}{\log 4} = x$

$x=3$

17. **Solve logx – log4 = 5**

$x>0$

$\log\left(\frac{x}{4}\right)=5$

$10^{\log\left(\frac{x}{4}\right)}=10^5$

$\frac{x}{4}=100000$

$x=400{,}000$

18. **Evaluate** $\log_3 \frac{1}{81}$

$= \frac{\log \frac{1}{81}}{\log 3}$

$= -4$

19. **Solve** $9^{n+3}=12$

$x=?$

$n+3=\log_9 12$

$n+3=\frac{\log 12}{\log 9}$

$n+3=1.13$

$-3 \quad -3$

$n=-1.87$

20. I bought a car for $32,000. It has depreciated in value at an annual rate of 12%. What is its value 4 years after purchase? $A(t)=a(1\pm r)^t$

$A(4)=32{,}000(1-.12)^4$

$\approx 19{,}190.75$

21. **Write in logarithmic form: $7^3=343$**

$3=\log_7 343$

22. Use change of base to find the answer: $\log_5 72$

$=\frac{\log 72}{\log 5}$

≈ 2.65

23. X and y vary inversely. Write a function that models the inverse variation when x=3 and y=-61

$y=\frac{a}{x}$

$-61=\frac{a}{3}\cdot\frac{3}{1}$

$a=-183$

$y=-\frac{183}{x}$

24. **Simplify** $\frac{x^2+10x+16}{x^2-6x-16} \cdot \frac{x+8}{x^2-64}$

$=\frac{x^2+10x+16}{x^2-6x-16}\cdot\frac{x^2-64}{x+8}$

$=\frac{(x+8)(x+2)}{(x-8)(x+2)}\cdot\frac{(x+8)(x-8)}{(x+8)}$

$=x+8$

25. **Simplify** $\frac{2}{x}+\frac{x}{2x}$

CD: $2x$

$=\frac{(4+x^2)}{2x}$

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Simplify $\frac{5}{x}+\frac{x}{5}$

Simplify $\sqrt{6x}\bullet\sqrt{12x^5}$

Solve $\sqrt{3x+1}=8$