Name_____ Algebra 2 Take-Home Quiz 5.1 – 5.6

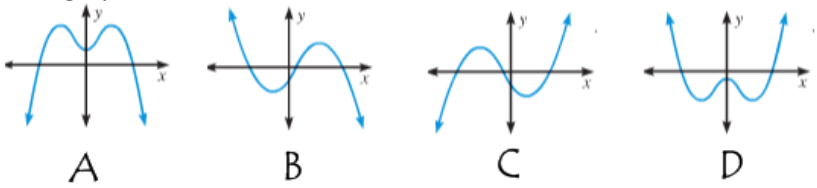
Simplify. Write your answers without negative exponents.

1. $w^5w^{-8}w^6$

2. $\left(\frac{c}{d^{-4}}\right)^{-2}$

3. $\left(\frac{a^{-3}b^2}{a^5}\right)$

4. For each function, circle whether the degree is odd or even, and whether the leading coefficient is positive or negative. Then choose the graph below that best shows the end behavior associated with the function.



a. $f(x) = x^3 - 2x^2 - 23x + 60$

Degree: Odd Even **Lead Coefficient:** Positive Negative **End Behavior:** A B C D

b. $f(x) = -2x^2 - 23x - x^4 + 60$

Degree: Odd Even **Lead Coefficient:** Positive Negative **End Behavior:** A B C D

5. Use synthetic substitution to evaluate the polynomial function for the given value of x. Show work.

$g(x) = 8x^4 + 5x^2 - 3x + 6$ for $x = 2$

6. *Describe* and correct the error in simplifying the expression.

a. $(x^2 - 4x + 5) - (x^3 + 2x - 8)$

$= x^2 - 4x + 5 - x^3 + 2x - 8$

$= -x^3 + x^2 - 2x - 3$

b. $(2x - 5)^3 = (2x)^3 - 5^3$

$= 8x^3 - 125$

Factor completely.

7. $2x^3 - 54$

8. $x^3 - 3x^2 + 2x - 6$

9. $6x^5 - 150x$

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

Divide using polynomial long division.
Show work.

11. $(x^3 - 2x^2 - 23x + 60) \div (x - 3)$

Divide using synthetic division.

12. $(x^3 + 8x^2 + 5x - 14) \div (x - 1)$

Find all real zeros of the function. **You must show work/steps !**

13. $f(x) = 2x^3 + 2x^2 - 8x - 8$

14. $f(x) = x^4 + 4x^3 - 13x^2 - 4x + 12$