

Review sheet chapter 4 – Use a separate sheet of paper

Describe the end behavior of each polynomial.

1. What defines the DEGREE of a polynomial?	2. What defines the LEADING COEFFICIENT of a polynomial?
3. Sketch a function with odd degree and positive leading coefficient.	4. Sketch a function with even degree and negative leading coefficient.

For the following choose the BEST answer or answers.

5. $f(x) = x^3 - 2x^2 - 4x + 8$ a. odd positive end behavior b. odd negative end behavior c. even positive end behavior d. even negative end behavior	6. $f(x) = x^3 - 2x^2 - 4x^4 + 8$ a. odd positive end behavior b. odd negative end behavior c. even positive end behavior d. even negative end behavior
7. $f(x) = x^3 - 2x^5 - 4x$ a. odd positive end behavior b. odd negative end behavior c. odd function	8. $f(x) = x^6 - 2x^4 - 4x^2 + 8$ a. even positive end behavior b. even negative end behavior c. even function

Sketch the graphs of the following and identify the extrema and where the function is increasing and decreasing and where the function is positive or negative.

$g(x) = x^3 - 3x^2 - 16x + 48$	9. $g(x) = x^6 - 9x^4 - x^2 + 9$
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Simplify the following using long and/or synthetic division. Confirm using the factor/remainder theorem.

10. $(x^3 - 3x^2 - 4x + 6) \div (x - 4)$	11. $\frac{x^4 - 8x^2 + 23}{x^2 + 2}$	12. $\frac{x^2 - 8x + 23}{x + 2}$
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13. Confirm that $(x^2 - 25)$ is a factor of $x^4 + 2x^3 - 20x^2 - 50x - 125$. Then factor completely.

For each of the following, write the polynomial of least degree with the given roots with leading coefficient 1.

14. 2, -3, $3i$	15. 2, $-3 + 2i$
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16. Use the data that follows to find a cubic equation of best fit.

x	1	5	9	15	18
y	1	253	1457	6747	11670

17. $g(x) = x^4 - 4x^2$, $h(x) = (x + 1)^4 - 4(x + 1)^2$ What transformation was done to g to change it to h ? What are the zeros of each?18. Volume of a Cylinder with height 5 cm is modeled by the formula $V(r) = 5\pi r^2$, if r is replaced with $3r$, the new formula is $W(r)$. Write the formula for W and use it to assess a cylinder whose radius was originally 4 cm.19. Prove $(n-1)n(n+1)(n+2) = (n^2 + n - 1)^2$

Also, review focus and directrix.