

Simplifying Polynomials – Divide (Long and Synthetic Division)

1) $(4x^4 - 15x^2 - 4) \div (x + 2)$

4) $(x^4 + 4x^3 - x - 4) \div (x^3 - 1)$

2) $(x^6 - 1) \div (x + 1)$

5) $(2x^4 - 3x^3 - 8x^2 + 5x + 4) \div (2x + 1)$

3) $(3x^3 + 34x^2 + 72x - 64) \div (x^2 + 12x + 32)$

6) $(x^4 + 3x^2 + x + 4) \div (x + 3)$

Factor COMPLETELY (Trinomials, Grouping, Sum/Difference of Cubes, Diff of Squares)

7) $8x^3 - 343$

11) $-4x^4 - 500x$

8) $x^4 + 7x^2 + 6$

12) $x^5 - 3x^4 - 16x + 48$

9) $25x^3 - 100x^2 - x + 4$

13) $x^2(x+3) - 1(x+3)$

10) $4x^3 + 8x^2 - 9x - 18$

14) $5x^4 + 45x^3 + 100x^2$

Factor/Remainder Theorem

15) Is $x + 3$ a factor of $x^3 + 4x^2 - x - 1$?

16) 15. Is $x - 4$ a factor of $x^3 - 6x^2 + 5x + 12$?

17) If $(x - 4)$ is a factor, what are all of the zeros of the polynomial? What are all the factors?

$$f(x) = x^3 - 13x - 12$$

Writing Polynomials Given Zeros

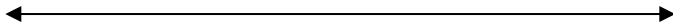
18) Write a polynomial equation given the zeros of the function are $\frac{2}{5}$, -3 , and 1 .

19) Write a polynomial equation given the zeros of the function are $3 \pm 2i$ and 5 .

Polynomial Inequalities

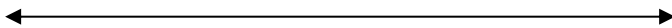
20) Graph the solution set on the given number line for the following inequality:

$$x^2 \geq 5x + 24$$



21) Graph the solution set on the given number line for the following inequality:

$$x^2 < -x + 20$$



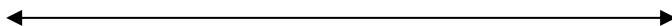
22) Graph the solution set on the given number line for the following inequality:

$$x^3 + x^2 - 16x > 16$$



23) Graph the solution set on the given number line for the following inequality:

$$x^3 - 7x^2 < 9x - 63$$



Regression: On the class practice sheet done in class!