0-1 Notes Things We Already Know Name _____
Pre-Calculus

I. Polynomials $-8x^3 + 4x^2 + 6x + 2$

a) degree of a polynomial –
b) leading coefficient –

A. Special Products

Difference of Squares	$(x – a) (x + a) = x^2 – a^2$
Perfect Squares	$(x + a)^2 = x^2 + 2ax + a^2$ $(x – a)^2 = x^2 – 2ax + a^2$
Perfect Cubes	$(x + a)^3 = x^3 + 3ax^2 + 3a^2x + a^3$ $(x – a)^3 = x^3 – 3ax^2 + 3a^2x – a^3$
Difference of Cubes	$(x – a) (x^2 + ax + a^2) = x^3 – a^3$
Sum of Cubes	$(x + a) (x^2 – ax + a^2) = x^3 + a^3$

B. Multiply

1. $(x – 3)(x + 3)$

2. $(x + 2)^2$

3. $(2x + 1)(3x + 4)$

4. $(x – 2)(x^2 + 2x + 4)$

C. Factor

5. $x^4 – 16$

6. $x^3 – 1$

7. $9x^2 – 6x + 1$

8. $x^2 + 4x - 12$

9. $3x^2 + 10x – 8$

10. $x^3 – 4x^2 + 2x – 8$

D. Simplifying Rational Expressions

11. $\frac{x^2 + 4x + 4}{x^2 + 3x + 2}$

12. $\frac{x^3 - 8}{x^3 - 2x^2}$

II. Quadratic Formula

Consider **$ax^2 + bx + c = 0$**

if $b^2 - 4ac < 0$, there are no real solutions

if $b^2 - 4ac > 0$, real solutions are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

The **discriminant** refers to $b^2 - 4ac$

13. Find the solutions, if any, of the equation:
$3x^2 - 5x + 1 = 0$

III. Interval Notation

Closed Interval [a , b]
≤ or ≥ closed circle

Open Interval (a , b)
< or > open circle
±∞ are always open

*connect **OR** statements with a U*

Write each inequality using interval notation.

14. $1 \le x \le 3$

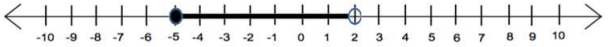
15. $-4 < x < 0$

16. $x > 5$

17. $x \le 1$

18. $x < -5$ or $x \ge 4$

19. $-6 < x < 0$ or $x \ge 5$

20. 

21.