MTH 30 LECTURE NOTES (Ojakian)

Topic 23: Last Issues ...

OUTLINE

1. Inverse Trig Functions (Section 6.3)

    (a) For cos restrict domain to $[0, \pi]$
    (b) For sin restrict domain to $[-\pi/2, \pi/2]$.
    (c) For tan restrict domain to $[-\pi/2, \pi/2]$
    (d) Exercises Section 6.3: 8 - 16

2. Trig Graphs (Section 6.1, 6.2)

    Multiplying AND Adding inside ...

    (a) Rewrite $\sin(Bx - C) = \sin(B(x - \frac{C}{B}))$, i.e. shift amount is $\dfrac{C}{B}$

    (b) Phase Shift: $\frac{C}{B}$ (i.e. the horizontal shift), which can be left or right phase shift.

    (c) Exercises Section 6.1: 15, 16, 17

3. Trig Equations (Section 7.5)

    (a) Isolate the trig function (or use algebra as if trig function is a variable)
    (b) In harder cases, may also need some trig identities
    (c) Find all terminal sides that work (take these angles)
    (d) If needed get other solutions by adding any amount of 2π.
    (e) Solve $\sin(x) = 1$ on the interval $[0, 2\pi)$
    (f) Exercises Section 7.5: 4 - 9, 19 - 25

4. Polynomials : Rational Zeroes Theorem

    For polynomials with integer coefficients.

    (a) Possible rational zeros $= \dfrac{\text{factor of constant}}{\text{factor of leading}}$

    (b) Exercises Section 6.5: 22 - 32

5. Polynomials : Remainder Theorem

    (a) Recall - Factor Theorem: k is a zero of a polynomial is EQUIVALENT to $(x - k)$ is a factor
    (b) Remainder Theorem: Evaluating a polynomial at k yields the remainder when the polynomial is divided by $(x - k)$

6. Lines

    (a) Recall: Two lines are Parallel if they have the same slope.
    (b) Two lines are perpendicular if their slopes are "negative reciprocals", that is if one has slope m, then the other has slope $-\dfrac{1}{m}$