Polynomial Functions Review

Day 1: Exploring Polynomial Functions

Degree - largest exponent of f(x)

Turning Points - # = degree − 1

End behaviour - odd → low to high for + leading coeff.

even → high to high for + lead. coeff.

Day 2: Polynomials in Factored Form (Zeroes of Polynomials)

$f(x) = a(x-s)(x-t)(x-r)\cdots$

a: leading coefficient

$(x-s)(x-t)(x-r)\cdots$: zeroes @ $s, t, r, \ldots$

single root: crosses x-axis

double: bounces

triple: stims along the x-axis

Day 3: Dividing Polynomials

synthetic when dividing by $(x-a)$ or $(ax+b)$

long division

Day 4: Remainder Theorem

$f(x) = x^3 - 5x - 5 \div x + 2$ when $f(x)$ is divided by $x+2$ the remainder is 9

$f(-2) = (-2)^3 - 5(-2) - 5$

$= -8 + 10 - 5$

$= 9$

ex// 2 unknowns in $f(x)$ but you are given 2 factors... make a system of eqn's and solve

Day 5: Factor Theorem

∴ if $P(a)=0$ then $(x-a)$ is a factor of $P(x)$

① find a factor of the constant that gives 0 remainder

② divide by that factor to get a lesser degree polynomial.

③ repeat until you get a quadratic then factor using grade 11 strategies

Day 6: Factoring Sum and Differences of Cubes

$27x^3 + 8$

$= (3x)^3 + (2)^3$

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

$= (3x+2)(9x^2 - 6x + 4)$

lower has real roots