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| Core  Standard | Standard | I can.../ I know... | example |
| A.APR.2 | Factor Theorem | I can use the factor theorem to identify zeros. | Given, is a factor? |
| A.APR.2 | Building Polynomials From Zeros | I can use zeros to create a polynomial in standard form. | Given, and , write a possible polynomial function in standard form.  Given  write a possible polynomial function in factored form. |
| N.CN.9 | Max. Number of Turning Points | I can calculate the maximum number of turning points for a graph of a polynomial. | How many possible turning points does  have? |
| A.APR.3 | Zero Product Property | I can use the zero product property to find zeros of a polynomial. | Find the zeros of . |
| A.REI.11 | Polynomial Inequalities | I can solve polynomial inequalities using a graph or sign chart. | Solve the inequality . |
| F.IF.7 | End Behavior | I can use the rules of end behavior to identify key features of polynomial graphs. | Describe the end behavior of (HONORS use limit notation.). |
| F.IF.7 | Real Life Modeling | I can use graphs of polynomials to model real life situations. | Bobby throws a baseball straight up with an initial velocity of 23 ft/sec. and an initial height of 5 ft. When will the ball be 15 ft in the air? |
| F.BF.1 | Real Life Modeling | I can model real life problems with a polynomial function. | Bobby throws a baseball straight up with an initial velocity of 23 ft/sec. and an initial height of 5 ft. When will the ball hit the ground? |
| A.APR.3 | Rational Roots Theorem | I can find the zeros of a polynomial function using Rational Root Theorem | Using des Cartes rule of signs, state the possible number of positive and negative real roots, then using the rational roots theorem to identify possible rational roots  Using synthetic or long division, find all roots(real and complex) of the polynomial and state the multiplicity  1. Using the Rational Zeros Theorem, which of the following could *not* be a zero of?  A. 2 B. 3 C.  D. -1  2. State the possible rational roots of the following: |
| A.CED.4 | Literal Equations | I can manipulate literal polynomial equations | 1. Charles’s Law states the volume V of an enclosed ideal gas at a constant pressure varies directly as the absolute temperature T. Select which equation matches this law.  a)  b)  c)  d)  2. Solve the following for *c*:  3. Solve the following for *r*: |
| A.APR.5 | Binomial Theorem | I can apply the binomial theorem to expand binomials | Expand using the binomial theorem:  Find the coefficient of the  term of .  Find the coefficient of the 5th term of . |
|  |  | I can calculate coefficients of an expanded binomials utilizing patterns from Pascal's Triangle |  |
| A.REI.2 | Solving Polynomials | I can solve polynomial equations | 1. Factor to solve:  2. Solve the following: |
| A.REI.11  F.IF.7 | Graphing/Transformations | I can graph polynomials functions by hand and using technology | Identify the roots of the polynomial and their multiplicity sketch the graph of the polynomial function. |
|  |  | I can analyze transformations from the parent function given an equation or a graph | Graph: |
|  |  | I can find domain and range of a polynomial function | State the domain and range:  State the domain and range: |
| A.SSE.1 | Def of a Polynomial | I can identify a polynomial from other expressions | Is  a polynomial |
|  |  | I can interpret the parts of a polynomial expression | Given a polynomial what is the degree, leading coefficient, constant term.... |
| N.CN.9 | Fundamental theorem of Algebra | Given a polynomial I can determine how many roots it will have | How many roots will have? |
|  |  | I know that all quadratics have 2 complex roots | Given the roots, what will the degree of that polynomial be |
| A.APR.1 | Closure | I know that if I add/sub/multiply 2 polynomials I will get a polynomial. | if and are polynomials will be a polynomial? |
|  |  | I know that if I divide 2 polynomials I'm not guaranteed a polynomial | if and are polynomials will be a polynomial? |
| F.FI.7 | Symmetry | I can identify algebraically and graphically whether a function is even, odd, or neither | Is  even odd or neither |
| A.APR.2 A.APR.3 | Apply the Remainder Theorem to identify zeros of polynomials | I can use synthetic division to find the zeros of a polynomial function | Given a zero use synthetic division to find the remaining zeros.  x=2;  *x =* i,  x = 4; |
| A.APR.2 A.APR.3 | Use long division to find zeros | I can use long division to find the zeros of a polynomial function | Given a zero use long division or synthetic division to find the remaining zeros.  ; |
| **F.BF.4d**  **(honors)** | Restricting the domain of a polynomial function to an interval where it is one-to-one so it will have an inverse that is a function. | I can restrict the domain of a polynomial function so that it is one-to-one | Restrict the domain of the polynomial function to an interval where it is one-to-one so it will have an inverse that is a function. Then find the inverse. |
| N.CN.8, | Complex Solutions | I can find complex solutions of polynomial equations given one complex solution. | Solve for all real and complex zeroes,  Suppose 3+4i is a zero of a polynomial, find another zero of the polynomial.  Find a polynomial that has the following zeros: 3, 2-i |
|  |  | I can find another and given complex solutions I can write a polynomial equation. | Factor the following polynomials: |
| A.SSE.2 | Factoring | I can factor polynomials by grouping, quadratic in form, difference of square, sum/difference of cubes | State the intervals on which the function is increasing or decreasing. |
| F.IF.4 | Increasing/decreasing | I can find intervals of increasing function values | Use your graphing calculator, state the intervals on which the function is increasing or decreasing. |
| F.IF.4 | Maximum/minimum | I can identify when a function would have a maximum/minimum and I can find maximum/minimum values of a function | Use your calculator to find the relative minimums and maximums of the function |
| A.SSE.1 | Coefficients, terms | I can understand the definition of "term," "coefficient," "factor," "degree." I can distinguish the terms of the polynomial. | Given the polynomial , identify the number of terms, the leading coefficient, the degree of the polynomial, and the constant term.  Give an example of a binomial of degree 4 and a trinomial of degree 4. |
| N.CN.9 | Complex Roots | I can use the fundamental theorem of algebra to recognize the number of complex roots in a polynomial | Give the number of complex roots of the following polynomials functions.   1. y = x + 3 2. x2 - 5x + 6 = y 3. y = -2x3 – 6x + 7 4. y = 4x5 + 3x3 – 5x – 9 |
|  |  | I can divide real zeroes from a polynomial to work down to a form from which I can take non-real zeroes. | Find all roots of each polynomial function.   1. y = x – 5 2. y = x2 – 3x – 10 3. y = x3 – x2 – 2x 4. y = x3 + 3x2 + 4x + 12 5. y = x4 – 2x3 – 6x2 – 18x – 135 |
|  |  | I can recognize that a polynomial has non-real roots from its graph. | Does the polynomial function have non-real roots?   1. y = x3 + 3x2 + 4x + 12     2) y = x4 – 2x3 – 6x2 – 18x – 135 |
| A.APR.2 | Remainder Theorem | I know that if performing synthetic division results in a remainder of 0, then (x-a) is a factor of p(x) | Use the remainder Theorem to determine if is a factor of. |
| A.REI.11 | Solving Systems | I can graph various types of polynomial equations | Graph |
|  |  | I can determine solutions, i.e.points of intersections, of various polynomial equations | Graph and determine the intersection of the functions: |