## Week 10 Groupwork

Remember to **show your work** as well as **box your answers**.

1. Let  $p(x) = 5x^5 - 42x^4 + 26x^3 + 156x^2 + 41x - 42$ .

- (a) Determine the far-right and far-left behavior of p(x)
- (b) Determine the *y*-intercept of p(x)
- (c) Using Decartes' rule of signs, find the list of possible numbers of positive and negative zeros.
- (d) Using the rational root test, make a list of all possible rational zeros of p(x)
- (e) Using synthetic division, determine the rational zeros of p(x) and their multiplicities. Afterwards, if necessary, find the rest of the zeros using techniques from chapter 1 and 2.
- (f) Sketch a graph of p(x), using all of the information above.

- 2. Let  $p(x) = 9x^5 6x^4 26x^3 + 36x^2 15x + 2$ .
  - (a) Determine the far-right and far-left behavior of p(x)
  - (b) Determine the *y*-intercept of p(x)
  - (c) Using Decartes' rule of signs, find the list of possible numbers of positive and negative zeros.
  - (d) Using the rational root test, make a list of all possible rational zeros of p(x)
  - (e) Using synthetic division, determine the rational zeros of p(x) and their multiplicities. Afterwards, if necessary, find the rest of the zeros using techniques from chapter 1 and 2.
  - (f) Sketch a graph of p(x), using all of the information above.

- 3. Let  $p(x) = 2x^6 + 5x^5 5x^4 21x^3 13x^2 + 4x + 4$ .
  - (a) Determine the far-right and far-left behavior of p(x)
  - (b) Determine the *y*-intercept of p(x)
  - (c) Using Decartes' rule of signs, find the list of possible numbers of positive and negative zeros.
  - (d) Using the rational root test, make a list of all possible rational zeros of p(x)
  - (e) Using synthetic division, determine the rational zeros of p(x) and their multiplicities. Afterwards, if necessary, find the rest of the zeros using techniques from chapter 1 and 2.
  - (f) Sketch a graph of p(x), using all of the information above.

- 4. Let  $p(x) = 6x^5 10x^4 26x^3 + 2x^2 + 12x$ .
  - (a) Determine the far-right and far-left behavior of p(x)
  - (b) Determine the *y*-intercept of p(x)
  - (c) Using Decartes' rule of signs, find the list of possible numbers of positive and negative zeros.
  - (d) Using the rational root test, make a list of all possible rational zeros of p(x)
  - (e) Using synthetic division, determine the rational zeros of p(x) and their multiplicities. Afterwards, if necessary, find the rest of the zeros using techniques from chapter 1 and 2.
  - (f) Sketch a graph of p(x), using all of the information above.