There will be no Descartes's Rule of Signs on the Test.

Discussion

Make some notes on the questions, then discuss what you wrote with a partner. Make note of anything that you and your partner disagree on, or that you had difficulty with.

1. Write down in words the things you need to sketch a polynomial.

2. Write down in words the things you need to sketch a rational function.

3. What are the three types of asymptotes? Draw example sketches of each, and include correct limit notation to explain each asymptote.

4. What do you use a sign chart to do? Why?

5. Explain in words how you solve the following types of equations:

- Equations involving square roots
- Equations of quadratic type
- Equations involving absolute values

6. Explain the technique in words to factor $f(x) = 12x^3 - 16x^2 + 7x - 1$.

7. Explain what an extraneous solution is.

8. Explain what a hole is, in relation to a rational function.

9. How can you tell if a function changes sign at a zero or vertical asymptote?

Computation

Work out solutions, and discuss with a partner as needed. Make sure your solutions are well organized, complete, and use correct mathematical notation. Make sure <u>any</u> sketch you draw is labelled.

10. Solve $\sqrt{x^2+1} + \sqrt{x^2-2} = 7$.

11. Sketch $f(x) = \dfrac{(3x-1)^2(x+1)}{(x-1)^3}$.

12. Solve $|2x - x^2| = 2x - 4$.

13. Solve $|2x| = 2 - |x|$.

14. Find all real and complex valued solutions to $12x^4 - 16x^3 + 36x^2 - 48x = 0$.

15. Determine, in interval notation, the solution to $x \leq \dfrac{1}{(x-2)^2}$.

16. Sketch $g(x) = \dfrac{(3x-1)^2 x}{(x-1)^2}$.

17. Sketch $f(x) = 7(2-x)^3(x^2 - 2x + 1)$.

18. Solve $(x^2+2x)^2 - (x^2+2x) - 2 = 0$.