

1011 Precalculus Chapter 2: Concepts to Review

This is a list of the concepts we have studied in Chapter 2. You should be able to answer questions dealing with these concepts. Study the homework, problems done in class, homework which was turned in for grading, and examples worked in the textbook. Quadratics were very important in this chapter, as well as creating sketches of functions by hand.

- Linear Functions $f(x) = mx + b$ (2.1)
- Quadratic Functions $f(x) = ax^2 + bx + c$ (2.1)
 - completing the square
 - vertex form $f(x) = a(x - h)^2 + k$
 - vertex and axis of symmetry
 - x -intercepts
 - average rate of change
- Power Functions $f(x) = kx^a, a \in \mathbb{R}, a \neq 0$ (2.2)
 - square root function
- Monomial Functions $f(x) = kx^n, n = 0, 1, 2, 3, \dots$ (2.2)
 - end behaviour for n even, n odd
 - sketching monomials
 - reciprocal function
- Polynomials (2.3)
 - terminology: term, coefficients, leading term
 - local extrema
 - end behaviour: $\lim_{x \rightarrow \infty} f(x)$ and $\lim_{x \rightarrow -\infty} f(x)$
 - zeros of polynomials, multiplicity, crossing x -axis
- Zeros of Polynomials (2.4)
 - long division algorithm for polynomials
 - remainder theorem (not on test)
 - factor theorem (not on test)
 - rational zero theorem (not on test)
- Sketching Polynomials (2.6)
 - Examine end behaviour (horizontal asymptotes, slant asymptotes),
Find any x -intercepts (factor the polynomial if possible),
Find the y -intercept, which is $f(0)$ (it might be a point of interest).
- Sketching Rational Functions of the form $f(x) = \frac{ax + b}{cx + d}$ (2.6)
 - find how f is transformed from the reciprocal function $y = 1/x$
- Sketching a General Rational Function (2.6)
 - Examine end behaviour (horizontal asymptotes, slant asymptotes),
Look for vertical asymptotes (factor the denominator if possible),
Find any x -intercepts (factor the numerator if possible),
Find the y -intercept, which is $f(0)$ (it might be a point of interest).
- Solving Equalities (2.7)
 - solving polynomial equations $f(x) = 0$
 - solving rational equations $f(x)/g(x) = 0$
 - * lowest common denominator
 - * extraneous solutions
 - * indeterminate forms ($\frac{0}{0}$ is an indeterminate form, you need to do some work to determine what it is)
- Solving Inequalities (2.8)
 - sign chart
 - polynomial inequalities
 - rational inequalities
 - radical inequalities, absolute value inequalities