You should be able to answer questions dealing with these concepts. Study the practice problems, guided examples, WeBWorK, and examples worked in the textbook, as well as the practice test.

- Average Rate of Change
- Linear Functions $f(x) = mx + b$
- Quadratic Functions $f(x) = ax^2 + bx + c$
  - 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 $f(x) = kx^a, a \in \mathbb{R}, a \neq 0$
  - square root function
  - direct variation
  - inverse variation
- Monomial Functions $f(x) = kx^n, n = 0, 1, 2, 3, \ldots$
  - end behaviour for n even, n odd
  - sketching monomials
  - reciprocal function
- Polynomials
  - terminology: term, coefficients, leading term
  - local extrema
  - end behaviour: $\lim\limits_{x \to \infty} f(x)$ and $\lim\limits_{x \to -\infty} f(x)$
  - zeros of polynomials, multiplicity, crossing x-axis
- Factoring
  - difference of squares: $a^2 - b^2 = (a - b)(a + b)$
  - perfect square: $a^2 \pm 2ab + b^2 = (a \pm b)^2$
  - difference of cubes: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
  - sum of cubes: $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
  - factoring by using quadratic formula
  - factoring by using long division algorithm
- Complex Zeros
  - arithmetic of complex numbers
  - complex conjugate of $a + bi$ is $a - bi$
  - a non-real zero of f is not an x-intercept of f
  - a polynomial of odd degree will have at least one real zero
- Zeros of Polynomials
  - long division algorithm for polynomials
  - remainder theorem
  - factor theorem
  - rational zero theorem
- Sketching Polynomials
  - 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 $f(x) = \dfrac{ax + b}{cx + d}$
  - find how f is transformed from the reciprocal function $y = 1/x$

- Sketching a General Rational Function
    - 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
    - solving polynomial equations $f(x) = 0$
    - solving rational equations $f(x)/g(x) = 0$
        * lowest common denominator
        * extraneous solutions
        * indeterminant forms ($\frac{0}{0}$ is an indeterminant form, you need to do some work to determine what it is)
- Solving Inequalities
    - sign chart
    - polynomial inequalities
    - rational inequalities
    - radical inequalities, absolute value inequalities