

Midterm 1 Review

Algebra

- Multiplying expressions out and simplifying (like section 1.2 problems). Also know how to do this when you first make a substitution (like problem 1.5.34)
- Factoring (using the quadratic formula)
- Working with fractions: getting a common denominator, adding, secret parentheses, multiplying (1.3)
- Solving systems of equations
 - Use one of the equations to eliminate one of the variables in another equation)
 - Check your answer works when you're done!
 - Know how to do this when there are other constants involved like a and b . See problem 4 on page 256.
- Find the inverse of a function $f(x)$. Example: $f(x) = 4x + 8$.
 1. Rewrite as $y = 4x + 8$
 2. Switch x and y : $x = 4y + 8$
 3. Solve for y : $y = \frac{x-8}{4}$.
 4. Rewrite as $f^{-1}(x) = \frac{x-8}{4}$.
 5. You can check your work by checking that $f(f^{-1}(x)) = x$:
 $f(f^{-1}(x)) = f\left(\frac{x-8}{4}\right) = 4\left(\frac{x-8}{4}\right) + 8 = x - 8 + 8 = x$.
- Also remember $f(a) = b \Leftrightarrow f^{-1}(b) = a$.
- Pythagorean Theorem problems (see 1.7.8 on page 31).
- Graph functions by plotting points or by using a table of values (like $y = x^2$, $y = x^3$, $y = 1/x$).

Ideas behind calculus

- Finding limits (see problem 5.1.2 on page 71)
- Summation notation (section 5.3)
- Find the slope of a line and equation of a line using slope-intercept form ($y = mx + b$) or point-slope form ($y - y_0 = m(x - x_0)$).
- Going from the parametric equations form of a line ($x =$ and $y =$ something in terms of t) to one of the two above forms.
- Finding where two lines intersect.
- Graphing lines.