

MATH 100 SAMPLE FINAL

This is a sample final exam. The questions here are similar to the questions on the final but not necessarily on the same topic. For example, the topic of complex numbers might be covered here by simplifying a complex number fraction while on the final you might be asked to find complex zeros of a polynomial. A question here about the slope of a perpendicular line might be replaced by a question about the distance formula on the final. In order to provide a more comprehensive review there are more questions on the sample midterm than there will be on the final.

You will be allowed one 8 1/2 by 11 sheet of notes (both sides of the page) for the final. A list of topics that might be covered on the final will be compiled during your Coaching Sessions.

- (1) (10 pts) The graph of $g(x)$ is shown above. Sketch the graph of $h(x) = g(x - 2)$.
- (2) (10 pts) The function $g(x)$ graphed above is a polynomial function. Is the degree of $g(x)$ odd or even?
- (3) (15 pts) Does the function $g(x)$ whose graph is shown above have an inverse $g^{-1}(x)$? If so, sketch the graph of $g^{-1}(x)$. If not, explain why not.
- (4) (10 pts) What is the equation of the line that passes through the points $(1, 3)$ and $(2, 5)$?
- (5) (10 pts) Simplify: $\frac{\frac{2x}{x+1}}{\frac{x+2}{x^2-1}}$.
- (6) (15 pts) Find all zeros (real and complex) of the function $f(x) = x^3 - 4x^2 + 5x$.
- (7) (15 pts) Give the equation of a function with zeros at $x = 1$ and $x = 2$ whose graph has a vertical asymptote at $x = 0$ and slant asymptote $y = 2x$.
- (8) (15 pts) Solve for x : $2\ln(x) + \ln(x + 1) = 0$.

Bonus (5 pts) Give the equation of a circle whose center is at the intersection of the parabola $y = x^2$ with the line $y = 2x - 1$ and whose radius is 2.