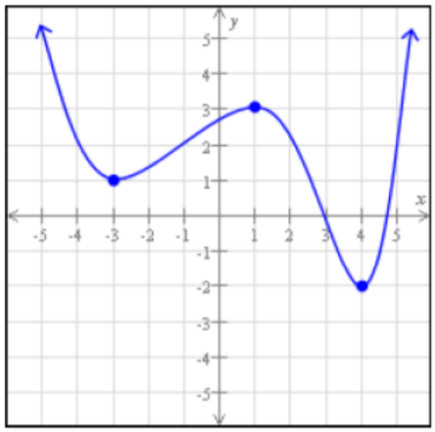
Math 117 Exam 1 Review Problems

These problems are intended to help you prepare for the test. Test problems will look similar to, but not the same as, some of the problems below.

This list of problems is not all inclusive and does not represent every possible type of problem. It is suggested that you review lectures, classwork problems, and homework problems in addition to this review.

Due on the day of the exam.

(1)



(a) Is this the graph of a function? How do you know?

(b) What are the coordinates (x, y) of each of the blue points?

(c) Where is the graph increasing and where is it decreasing? Write your answers in **interval notation**.

(d) What is the domain and what is the range? Write your answers in **interval notation**.

(2) Let $f(x) = x^2 - 2x$

(a) Find the average rate of change of f from $x = -2$ to $x = 3$

(b) Find the difference quotient $\frac{f(x+h)-f(x)}{h}$

(3) Solve for x:

(a) $6x + 7 < 3x + 40$

(b) $x^2 + 11x + 30 = 0$

(c) $x^2 - 2x = 2$

(d) $3(x - 2) + 8 = 2(x + 5)$

(4) (a) Write the following equation of a circle in standard form: $x^2 - 4x + y^2 + 10y = -20$. Then find the center and radius of the circle.

(b) Find the location of the vertex of the following parabola: $y = 4x^2 + 8x + 1$

(5) (a) Find an equation (in any form) of a line that goes through $(-5, -2)$ and $(5, 14)$

(b) Find an equation (in any form) of the line that is perpendicular to $2y - 2 = 4x$ and goes through $(3, -3)$

(6) Imagine you're taking a course where your final grade is decided by the average of your exam grades. You received a grade of 84 and 89 on the first two exams, and there is an optional final exam that you can take to try and improve your average.

(a) What is your current grade based on the average of the two exams?

(b) If you take the final exam, what is the lowest grade you must get to ensure that you get an A in the course (i.e. at least a 90 average)?

(7) (a) Find the center, radius, x-intercept(s), and y-intercept(s) of the circle: $x^2 - 2x + y^2 = 7$

(b) Find the equation (in slope-intercept form) of the line through the point $(-1, -1)$ and $(2, 3)$

(8) Consider the circle $x^2 - 2x + y^2 = 7$

(a) Find the center and radius

(b) Find the x and y intercepts

(9) (a) Find any equation for the line through $(3, -1)$ and $(1, 2)$

(b) Find any equation for the line with slope 0 and y-intercept 14

(10) (a) Find the domain of $y = \sqrt{3x + 12}$

(b) List which of the following images are functions: