Algebra for Math 108

In Math 108, we will assume that you can handle the algebra of first and second degree polynomials with no problems and without a calculator (except to decimalize your answers). Here are examples of what we will assume you can do. Do not ask yourself "Did I see this stuff before?" Instead ask "Can I work these problems right now?" If you are not sure how to solve those problems right now, review the book's first chapter ASAP, or enroll in Math 103 before taking this course.

1) Solve $17x+25=16$.

2) Use factoring or the quadratic formula

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

to solve quadratic equations such as $3x^2+7x=2$ and $x^2+x=6$. You will be expected to have the quadratic formula in your memory, and know how to use it.

3) Solve the system of equations

$3x+4y=6$
$x+y^2=7$.

4) Consider the curve $y=x^2+x$. For which point(s) (x,y) on the graph of that curve will $x=5$? For which point(s) on the graph of that curve will $y=6$?

5) What is the shape of the graph of $y=x^2-5x+7$? of $x^2+y^2=9$? of $y=\frac{1}{x}$?

6) Why is $\frac{3ab+12a^2}{3a}\neq b+12a^2$?

7) If $f(x)=x^2+3x$, what is $f(5+h)$?

8) Where does the curve $y=\frac{2x^2+x}{x-2}$ cross the x-axis?

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Solutions:

1) $x=-\frac{9}{17}$

2) The solutions of the first quadratic equation are approximately x = -2.590667291 and x = 0.2573339576. The solutions of the second equation are exactly $x=-3$ and $x=2$.

3) The solutions are $x=\frac{38}{9}$, $y=-\frac{5}{3}$ and $x=-2, y=3$.

4) $(5,30)$; $(2,6)(-3,6)$

5) parabola opening upward, circle with center at origin and radius 3, hyperbola

6) You cannot cancel that way. Instead $\frac{3ab+12a^2}{3a}=b+4a$

7) $40+13h+h^2$.

8) at $x=0$ and $x=\frac{1}{2}$