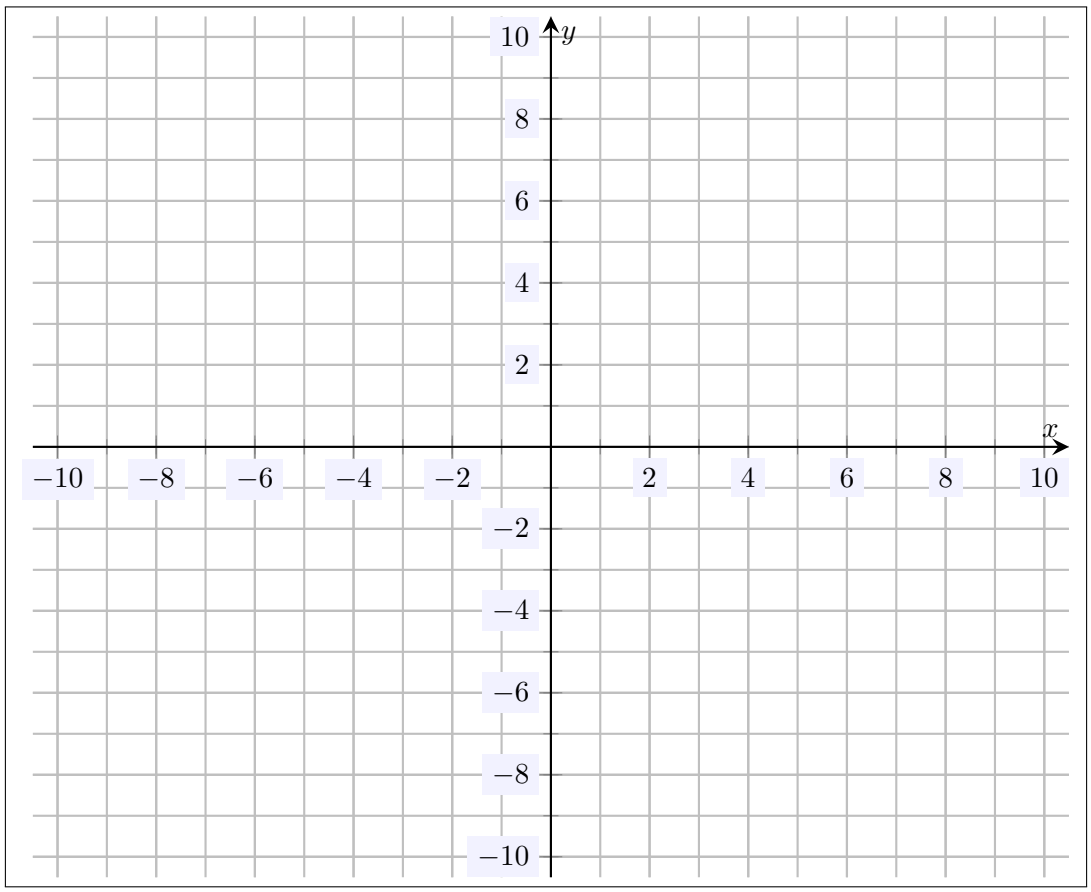
Name: _____

MATH 101
Winter 2021
HW 7: Due 01/13

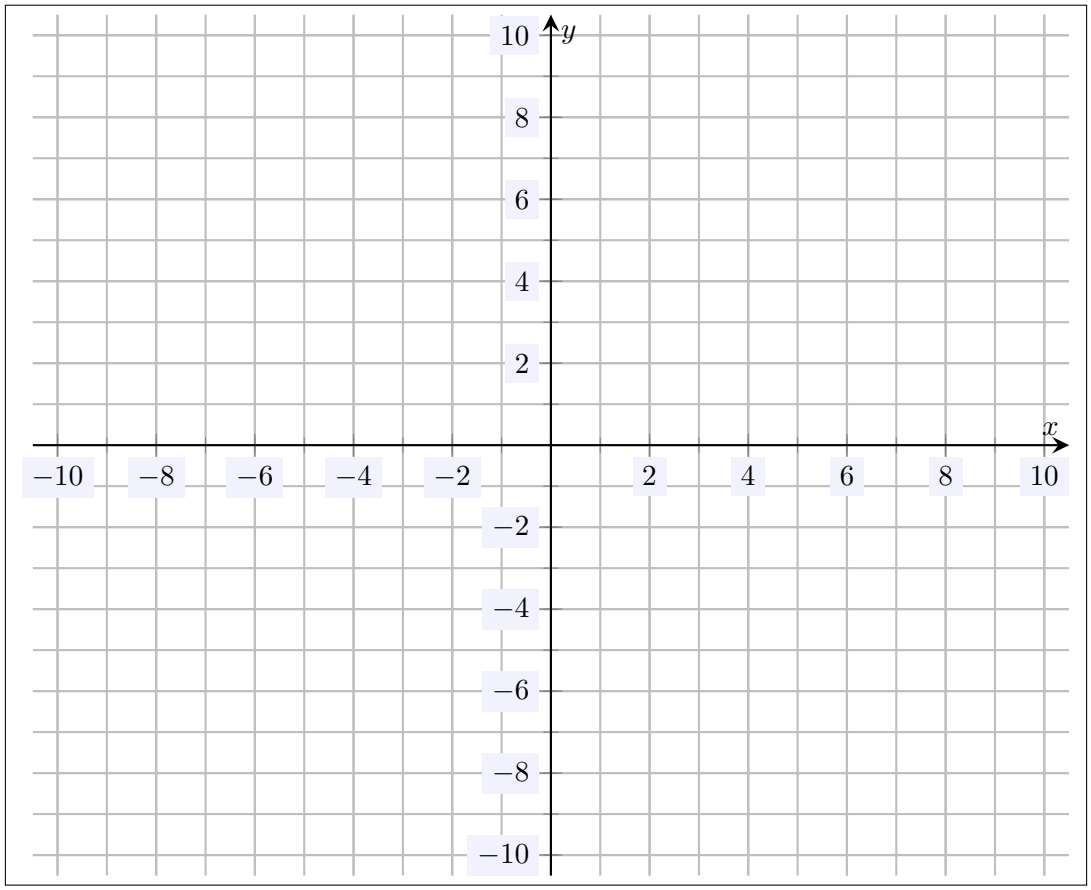
"You guys I'm, like, really smart now. You don't even know. You could ask me, 'Kelly, what's the biggest company in the world?' And I'd be like, 'blah blah blah, blah blah blah blah blah blah.' Giving you the exact right answer."

–Kelly Kapoor, The Office

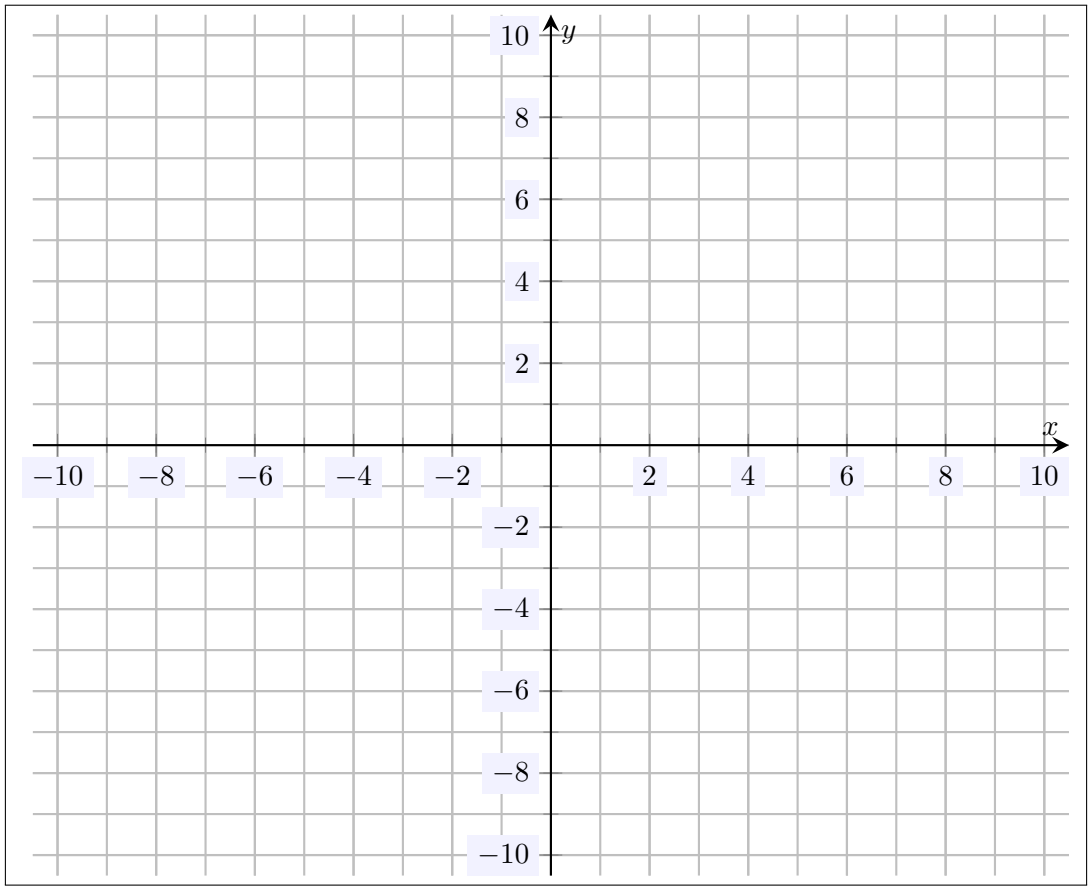
Problem 1. (10pt) Sketch the function $f(x) = (x+3)^2 - 5$.



Problem 2. (10pt) Sketch the function $f(x) = 8 - 2(x-6)^2$.



Problem 3. (10pt) Sketch the function $f(x) = x^2 - 10x + 16$.



Problem 4. (10pt) Find the vertex form of $y = -2x^2 + 12x - 13$ by completing the square.

Problem 5. (10pt) Find the vertex form of $y = x^2 - 12x + 48$ by the 'evaluation method.'

Problem 6. (10pt) Showing all your work, factor $x^2 + 14x - 51$.

Problem 7. (10pt) Showing all your work, factor $x^2 + 10x - 56$.

Problem 8. (10pt) Showing all your work, factor $3x^2 + 7x - 20$.

Problem 9. (10pt) Consider the quadratic function $f(x) = x^2 + 14x + 39$.

(a) Determine if the parabola opens upwards or downwards.

(b) Is the parabola convex or concave?

(c) Does the parabola have a maximum or minimum?

(d) Find the vertex and axis of symmetry.

(e) Find the maximum/minimum value of $f(x)$.

Problem 10. (10pt) Consider the quadratic function $f(x) = -2x^2 + 4x + 3$.

(a) Determine if the parabola opens upwards or downwards.

(b) Is the parabola convex or concave?

(c) Does the parabola have a maximum or minimum?

(d) Find the vertex and axis of symmetry.

(e) Find the maximum/minimum value of $f(x)$.