

Quadratics (and friends: Parabolas and lines)

Question:

You are given two functions.

1. Parabola $f(x)$:

$$f(x) = 2x^2 - 12x + 20$$

2. Straight line $g(x)$:

$$g(x) = 4x + c, \quad \text{where } c \text{ is a real number.}$$

Find the value(s) of c , if these exist, for which the graphs of the functions intersect in exactly 2- points, 1-point, and do not intersect at all.

You need to algebraically calculate these values, and demonstrate these on a graph.

Some specific guides and rules:

1. Show your work.
2. You need to rely only on material we learned in class.

General rules for challenge questions:

1. You are allowed to work with a group and collaborate with up to 3 people.
2. If you work as a group (or collaborate), keep in mind:
 - a. Each member should submit her/his own work.
 - b. Each member needs to write the names of all group members on the work.
3. You are allowed to have external (adult, tutor, etc.) help, but please don't solicit for the full solution. The goal is for you yourself to try and solve it, and understand the subtleties of the problem. Again, please note that as well on the sheet. NO points will be taken off: I just want to have a real appreciation of how the class is doing on these.
4. Have fun solving it!!

=== End ===
