Answers to selected problems in Homework 1

Page 9.
3. All sets are infinite except $H$.
4. Yes for the intersection (if we count empty set as an interval by convention), no for union.
5. Yes.
8. There is no unique answer to this problem. You can say that between any two numbers, there is always a rational number. That is hard to draw!

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1. The same.
2. $f(x) = 7/(x^2 + 1)$. Domain is all reals.
4. $f(x) = 2|x| - x$. Domain is all reals, range is $[0, \infty)$.
5. $f(x) = -x + \sqrt{x^2 - 2x + 5}$. Domain is all reals.
18. For $f : [3, \infty); g : (-\infty, 2]; k : [-3, 5]; m : (0, 1/2]$.
20. $m = -3 \pm 2\sqrt{2}; n = -2 \pm 2\sqrt{2}$.