1 *Let F be the function such that*

$$F(z) = \frac{2z+1}{z-5}$$

for every possible real number z. What is the domain of F? (Show at least one intermediate step.)

The operations involved in the formula for F are addition, subtraction, multiplication, and division. Most of these are always defined, but division by zero is undefined. Since the formula asks us to divide by $z-5$, this cannot be zero. Thus:

$$z - 5 \neq 0;$$
$$z \neq 5.$$

This is enough; but a fully proper answer would be either of the following:

$$\operatorname{dom} F = \{z \mid z \neq 5\},$$
$$\operatorname{dom} F = (-\infty, 5) \cup (5, \infty).$$

(The latter of these uses interval notation, which is probably more trouble than it's worth here, although it's often nice when you get the answer from a graph.)

2 *Let f be the function whose graph appears in Exercise 8.4.9 of the textbook.*

a *What is $f(6)$?*

Since $(6, 2)$ is on the graph of f,

$$f(6) = 2.$$

b *What is the solution to the equation $f(x) = 3$?*

Since $(-3, 3)$ is on the graph of f, $f(-3) = 3$; furthermore, the *only* point $(x, 3)$ on the graph is $(-3, 3)$. Therefore, the solution to the equation is simply

$$x = -3.$$