Math 407, Fall 2008, Assignment 1, Due September 3

In Problems 1–7, does the equation have a solution? Explain how you know without solving it.

1. $2x - 3 = 7$
2. $x^2 + 3 = 7$
3. $4 = 5 + x^2$
4. $2 + 5x = 6 + 5x$
5. $\dfrac{x+3}{2x+5} = 1$
6. $\dfrac{x+3}{5+x} = 1$
7. $\dfrac{x+3}{2x+6} = 1$

In Problems 8–11, the solution depends on the constant a. Assuming a is positive, what is the effect of increasing a on the solution? Does it increase, decrease, or remain unchanged? Give a reason for your answer that can be understood without solving the equation.

8. $x - a = 0$
9. $ax = 1$
10. $ax = a$
11. $\dfrac{x}{a} = 1$