



**Figure 34.14** The graph  $G$  derived from the 3-CNF formula  $\phi = C_1 \wedge C_2 \wedge C_3$ , where  $C_1 = (x_1 \vee \neg x_2 \vee \neg x_3)$ ,  $C_2 = (\neg x_1 \vee x_2 \vee x_3)$ , and  $C_3 = (x_1 \vee x_2 \vee x_3)$ , in reducing 3-CNF-SAT to CLIQUE. A satisfying assignment of the formula has  $x_2 = 0$ ,  $x_3 = 1$ , and  $x_1$  may be either 0 or 1. This assignment satisfies  $C_1$  with  $\neg x_2$ , and it satisfies  $C_2$  and  $C_3$  with  $x_3$ , corresponding to the clique with lightly shaded vertices.