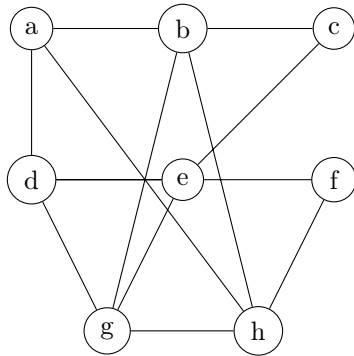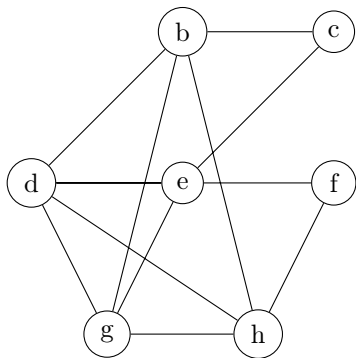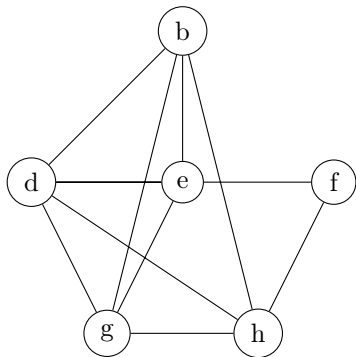## Exercise 10.1

We will do three transformations to G to show that it has K_5 as a minor. This is the original graph:
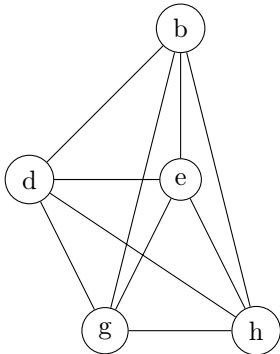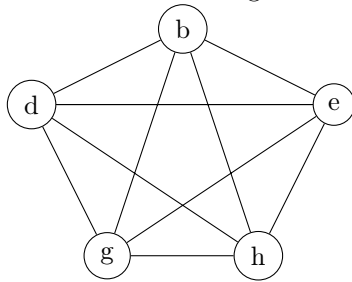

1. Contract $\{a, d\}$

2. Contract $\{c, e\}$

3. Contract $\{f, e\}$

When we rearrange the nodes we can clearly see that it's a K_5 graph. Thus G is not planar.

Exercise 10.2

(a)

(b)

Exercise 10.3

(a)

(b)

Exercise 10.4

(a)

(b)