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## Q08 - Listeners accessed programmatically

Considering Servlets 3.0, which listeners can be added programatically:

- a. ServletContextListener
- b. ServletContextAttributeListener
- c. ServletRequestListener
- d. ServletRequestAttributeListener
- e. HttpSessionActivationListener
- f. HttpSessionAttributeListener
- g. HttpSessionBindingListener
- h. you cannot add listeners programatically

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**a, b, c, d, f**

**Reference:** page 34, 4.4.3 "Programmatically adding and configuring Listeners"

**Explanation:** As said before, the programmatically addition of listeners / servlets / filters can be made **only before** the `ServletContext` is fully initialized. This means that in common cases programmatic addition of `ServletContextListener` is **useless**. However, there is a special case when `ServletContextListener` **can be programmatically registered** - it's when the `ServletContext` is obtained from the `ServletContainerInitializer#onStartup()` method.

The `HttpSessionActivationListener` and `HttpSessionBindingListener` are listeners related to the particular object and as-is doesn't need to be registered **at all**.