In [ ]:
```
xs = np.linspace(-1, 1, size)

ns = np.array([5, 10, 20])
f_approxs = np.zeros((ns.size, size))
sum1 = 0
sum2 = 0
sum3 = 0
for i in range(len(cheb_dict.keys())):
    cheb_func = Cheb(x, i)
    if i <= ns[0] : sum1 += cheb_dict[i] * cheb_func
    if i <= ns[1] : sum2 += cheb_dict[i] * cheb_func
    if i <= ns[2] : sum3 += cheb_dict[i] * cheb_func

lam_sum = sm.lambdify(x, sum1, modules=['numpy'])
f_approxs[0, :] = lam_sum(xs)

lam_sum = sm.lambdify(x, sum2, modules=['numpy'])
f_approxs[1, :] = lam_sum(xs)

lam_sum = sm.lambdify(x, sum3, modules=['numpy'])
f_approxs[2, :] = lam_sum(xs)
```

In [ ]:
```
fig, axs = plt.subplots(1, 1, figsize = (8, 8))

f_true = np.linspace(1, 5, size)
lam_true = sm.lambdify(x, f(x), modules=['numpy'])
f_true = f(f_true)
for i, line in enumerate(f_approxs):
    axs.plot(unmapping(xs), np.abs(line - Actual_sol), label=f"{ns[i]}")

axs.set_yscale('log')
axs.legend(loc='upper right')
axs.set_ylabel("Error (Log)")
axs.set_xlabel("x")
axs.grid(True)
fig.gca().set_facecolor((0.9, 0.9, 0.9))
axs.set_title(r"Log Error of Approximate and True solution to $A\boldsymbol{x} = \boldsymbol{b}$")
```

In [ ]:
```
for i, line in enumerate(f_approxs):
    err = np.linalg.norm(line - Actual_sol, ord = 2) / np.linalg.norm(Actual_sol, ord = 2)
    print(f"Error for n = {ns[i]} : ", err)
```