3. Sea $f(x)=(x+2)(x+1)^2x(x-1)^3(x-2)$ ¿Para qué cero de f el Método de Bisección converge cuando se aplican los intervalos siguientes para su búsqueda?

a) $[-1.5, 2.5]$

$$m = -1.5 + \frac{2.5+1.5}{2} = 0.5$$

$f(a) = -10.25 \quad f(b) = 232.55 \quad f(m) = 0.52$

$[-1.5, 0.5]$

$$m = -1.5 + \frac{0.5+1.5}{2} = -0.5$$

$f(a) = -10.25 \quad f(b) = 0.52 \quad f(m) = -1.58$

$[-0.5, 0.5] \quad m = 0$

$f(a) = -1.58 \quad f(b) = 0.52 \quad f(m) = 0$

Raíz $x = 0$.

b) $[-0.5, 2.4]$

$$m = -0.5 + \frac{2.4+0.5}{2} = 0.95$$

$f(a) = -1.58 \quad f(b) = 133.98 \quad f(m) = 0.0013$

c) $[-0.5, 3]$

$m = -0.5 + \frac{3+0.5}{2} = 1.25$

$f(a) = -1.58 \quad f(b) = 1920 \quad f(m) = -0.24$

$[1.25, 3] \quad m = 1.25 + \frac{3-1.25}{2} = 2.125$

$f(a) = -0.24 \quad f(b) = 1920 \quad f(m) = 15.23$

$[1.25, 2.125]$

$m = 1.25 + \frac{2.125-1.25}{2} = 1.6875$

$f(a) = -0.24 \quad f(b) = 15.23 \quad f(m) = -4.56$

$[1.6875, 2.125]$

$m = 1.6875 + \frac{2.125 - 1.6875}{2} = 129/64$

$f(a) = -4.56 \quad f(b) = 15.23 \quad f(m) = 1.20$

$[1.6875, 129/64]$

$m = 1.6875 + \frac{129/64 - 1.6875}{2} = \frac{251}{128}$

$f(a) = -4.56 \quad f(b) = 1.20 \quad f(m) = -2.36$

$[\frac{251}{128}, \frac{129}{64}]$

$|b - a| < 0.1$

Raíz ≈ 2

d) $[-3, -0.5]$

$m = -3 + \frac{-3+0.5}{2} = -1.75$

$f(a) = 3840 \quad f(b) = -1.58 \quad f(m) = -19.19$

$[-3, -1.75]$

$m = -3 + \frac{-1.75+3}{2} = -2.375$

$f(a) = 3840 \quad f(b) = -19.19 \quad f(m) = 283.204$

$[-2.375, -1.75]$

$m = -2.375 + \frac{-1.75+2.375}{2} = -2.0625$

$f(a) = 283.204 \quad f(b) = -19.19 \quad f(m) = 16.98$

$[-2.0625, -1.75] \quad m = -1.90625$

$f(a) = 16.98 \quad f(b) = -19.19 \quad f(m) = -14.07$

$[-2.0625, -1.90625] \quad m = -1.984375$

$f(a) = 16.98 \quad f(b) = -14.07 \quad f(m) = -3.18$

$[-2.0625, -1.984375]$

$|b - a| < 0.1$

Raíz ≈ -2