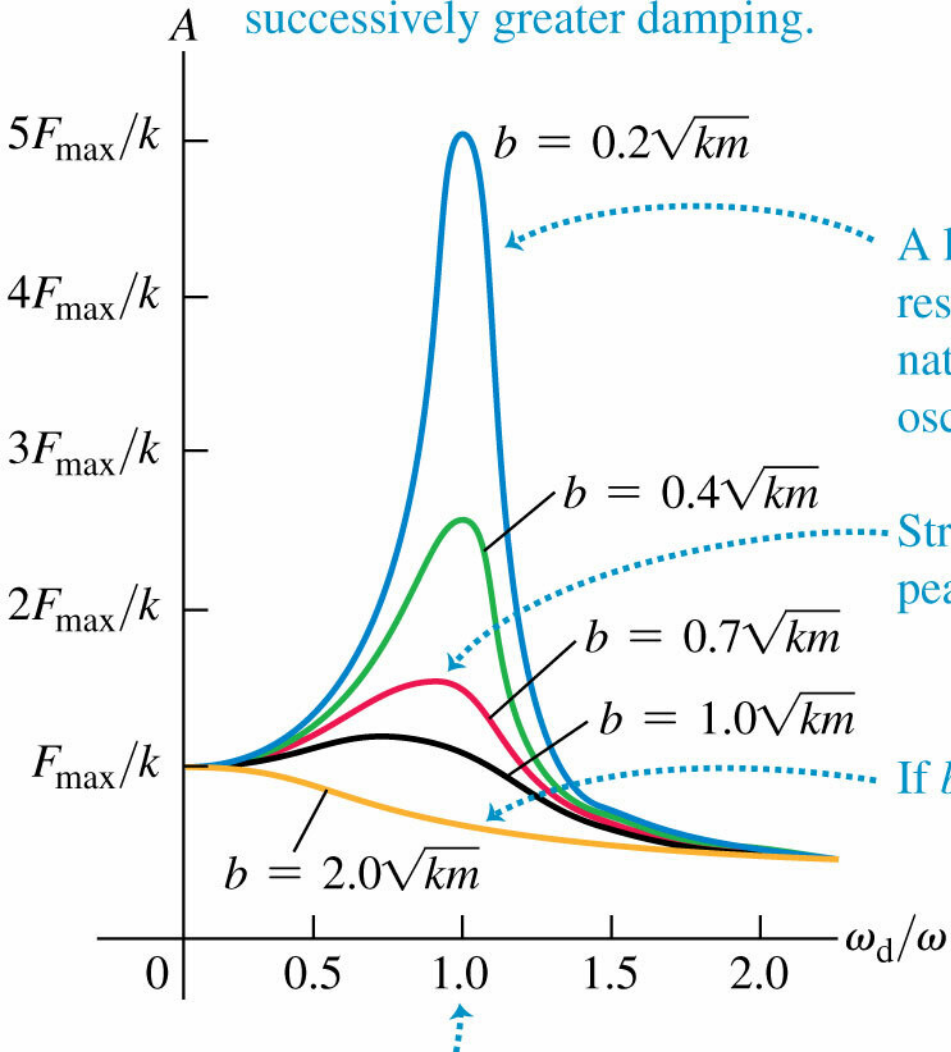Each curve shows the amplitude A for an oscillator subjected to a driving force at various angular frequencies ω_d. Successive curves from blue to gold represent successively greater damping.

$b = 0.2\sqrt{km}$

$b = 0.4\sqrt{km}$

$b = 0.7\sqrt{km}$

$b = 1.0\sqrt{km}$

$b = 2.0\sqrt{km}$

A lightly damped oscillator exhibits a sharp resonance peak when ω_d is close to ω (the natural angular frequency of an undamped oscillator).

Stronger damping reduces and broadens the peak and shifts it to lower frequencies.

If $b \geq \sqrt{2km}$, the peak disappears completely.

Driving frequency ω_d equals natural angular frequency ω of an undamped oscillator.

ω_d/ω

$5F_{max}/k$
$4F_{max}/k$
$3F_{max}/k$
$2F_{max}/k$
F_{max}/k

0   0.5   1.0   1.5   2.0