A loaded railroad car weighing 35,000 lb is rolling at a constant velocity of 15 mph when it couples with a spring and damper system. If the recorded displacement-time curve of the unloaded system, and the displaced car is empty. The unloaded railroad car weighs 8000 lb.

(a) $k = 25,653$ lb/in.
(b) $f = 0.182$
(c) $f = 0.38$

**Solution**

But as shown,

(a) $x = 0.34 - 0.34 e^{-t}$

(b) $f = 0.182$

(c) $f = 0.38$