> $bn := \dfrac{int\left(M \cdot \sin\left(\dfrac{n \cdot \text{Pi} \cdot x}{L}\right), x = \dfrac{L}{4} .. \dfrac{L}{2}\right)}{int\left(\sin^2\left(\dfrac{n \cdot \text{Pi} \cdot x}{L}\right), x = 0 .. L\right)}$ assuming $(L > 0, n, integer, n > 0)$

$$bn := \frac{2M\left(\cos\left(\dfrac{n\pi}{4}\right) - \cos\left(\dfrac{n\pi}{2}\right)\right)}{n\pi} \qquad (1)$$

> bn

$$\frac{2M\left(\cos\left(\dfrac{n\pi}{4}\right) - \cos\left(\dfrac{n\pi}{2}\right)\right)}{n\pi} \qquad (2)$$

> $phin := \sin\left(\dfrac{n \cdot \text{Pi} \cdot x}{L}\right)$

$$phin := \sin\left(\dfrac{n\pi x}{L}\right) \qquad (3)$$

> $fs := subs\left(M = 1, L = 10, c = 1, sum\left(bn \cdot phin \cdot \cos\left(\dfrac{n \cdot \text{Pi} \cdot c \cdot t}{L}\right), n = 1 .. 100\right)\right) :$

> $with(plots) :$
> $animate(fs, x = 0 .. 10, t = 0 .. 20) :$
> $curves := [seq(subs(t = 2 \cdot m, fs), m = 0 .. 10)] :$
> $plot(curves, x = 0 .. 10, thickness = [1, 2, 3, 4, 5, 6], color = blue)$

>