Given: $m=1$, $k=\frac{1}{16}$, $F(t)=3\sin t$, $t=0$

$$16\left(y'' + \frac{1}{16}y = 3\sin t\right)$$
$$16y'' + y = 48\sin t$$

$$16r^2 + 1 = 0$$
$$\sqrt{r^2} = \sqrt{-\frac{1}{16}}$$
$$r = \frac{1}{4}i$$

$$y_c = C_1\cos\frac{t}{4} + C_2\sin\frac{t}{4}$$
$$y_p = A\cos t + B\sin t$$
$$y_p' = -A\sin t + B\cos t$$
$$y_p'' = -A\cos t - B\sin t$$

$$16(-A\cos t - B\sin t) + A\cos t + B\sin t = 48\sin t$$
$$\cos t(-16A + A) + \sin(-16B + B) = 48\sin t \qquad \text{let } A=0$$
$$\cos t(-16\times 0 + 0) + \sin(-15B) = 48\sin t$$
$$-15B\sin t = 48\sin t$$
$$B = -\frac{48}{15} = -\frac{16}{5}$$

$$y_p = -\frac{16}{5}\sin t$$

$$y = C_1\cos\frac{t}{4} + C_2\sin\frac{t}{4} - \frac{16}{5}\sin t$$

$$y'(t) = -\frac{1}{4}C_1\sin\frac{t}{4} + \frac{1}{4}C_2\cos\frac{t}{4} - \frac{16}{5}\cos t \qquad y'(0)=0$$
$$0 = -\frac{1}{4}C_1\sin\left(\frac{0}{4}\right) + \frac{1}{4}C_2\cos\left(\frac{0}{4}\right) - \frac{16}{5}\cos(0)$$
$$0 = \frac{1}{4}C_2 - \frac{16}{5}$$

$$4\left(\frac{16}{5}\right) = \left(\frac{1}{4}C_2\right)4$$
$$C_2 = \frac{64}{5}$$

displacement: $\frac{64}{5}\sin\frac{t}{4} - \frac{16}{5}\sin t$

$$\boxed{y = \frac{16}{5}\left(4\sin\frac{t}{4} - \sin t\right)}$$