

高一年级数学 5.7 函数的应用拓展提升作业答案

1. $y = -6\sin\frac{\pi}{6}x$

设 y 与 x 的函数关系式为 $y = A\sin(\omega x + \phi)$ ($A > 0, \omega > 0$), 则 $A = 6, T = \frac{2\pi}{\omega} = 12, \omega = \frac{\pi}{6}$.

当 $x = 9$ 时, $y_{\max} = 6$.

故 $\frac{\pi}{6} \times 9 + \phi = \frac{\pi}{2} + 2k\pi, k \in \mathbb{Z}$.

取 $k = 1$ 得 $\phi = \pi$, 即 $y = -6\sin\frac{\pi}{6}x$.

2. $\frac{g}{4\pi^2}$

[由已知得 $\frac{2\pi}{\sqrt{\frac{g}{l}}} = 1$, 所以 $\sqrt{\frac{g}{l}} = 2\pi, \frac{g}{l} = 4\pi^2, l = \frac{g}{4\pi^2}$.]

3. 设 h 关于 t 的解析式为 $h = A\sin(\omega t + \phi)$,

则有 $h(0) = 0$, 即 $\sin \phi = 0$,

因此可取 $\phi = 0$;

又 $\frac{2\pi}{|\omega|} = 12$, 取 $\omega = \frac{\pi}{6}$,

则有 $h = A\sin\frac{\pi}{6}t$, 又 $h(3) = A\sin\frac{\pi}{2} = A = -6$,

故所求解析式为 $h = -6\sin\frac{\pi}{6}t$.

4. 20.5

5. $\frac{\pi}{3}$