1. $\Phi_B(t) = B_0 a^2 \sin(\omega t)$, so $\mathcal{E} = -B_0 a^2 \cos(\omega t)$
2. $\Phi_B(t) = (4B_0 a^2/\pi^2)\cos(\omega t)$, so $\mathcal{E} = (4B_0 a^2/\pi^2)\sin(\omega t)$
3. $\Delta\Phi_B = (v\Delta t)aB_0$, so $\mathcal{E} = -d\Phi_B/dt = -\Delta\Phi_B/\Delta t = avB_0$, and $I = \mathcal{E}/R = avB_0/R$
4. $\Phi_B(t) = a^2 B_0 \cos(\omega t)$, so $\mathcal{E} = B_0 a^2 \sin(\omega t)$, and $I = B_0 a^2 \sin(\omega t)/R$, so $P = I\mathcal{E} = (B_0 a^2)^2 \sin^2(\omega t)/R$
5. $\Phi_B(t) = a\int_{x_0+vt}^{x_0+vt+a} dx\ \mu_0 I/x = a\mu_0 I \ln(1 + a/(x_0+vt))$, so $\mathcal{E} = -a\mu_0 I/(1+a/(x_0+vt)) \cdot a/(x_0+vt)^2 \cdot v$