Given $P(t) = 50e^{0.5t}$, rewrite as an exponential function with base 10

1) Rewrite as $P(t)=50\left(e^{0.5}\right)^{t}$

2) Now we have to rewrite $e^{0.5}$.

Set $e^{0.5} = 10^{p}$ This says these two play the same role

$\log\left(e^{0.5}\right) = \log\left(10^{p}\right)$

$\log\left(e^{0.5}\right) = 0.217$

$0.217=p\log(10)$

$\log(10)=1$

$0.217=p$

3) Now write $P(t) = 50\left(10^{0.217}\right)^{t}$ Also, $0.217=\frac{1}{4.6}$

4) So rewrite one more time: $P(t) = 50\left(10^{\frac{1}{4.6}}\right)^{t} = 50\,(10)^{\frac{t}{4.6}}$