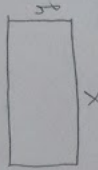


14 interest at 18% = $0.18 \times 1000000 = 180000$
 \Rightarrow At 16% they need to lend: $P = \frac{180000}{0.16} = 1125000$
 \Rightarrow At 19% they need to lend: $P = \frac{180000}{0.19} = 947368.421$

15  $\left. \begin{array}{l} \text{Area} = x \cdot y \\ \text{Perimeter} = 2x + 2y \end{array} \right\} \Rightarrow \begin{cases} xy = 2(2x + 2y) \\ x = 2y \end{cases}$

$\Rightarrow 2y^2 = 2(4y + 2y)$
 $\Rightarrow 2y^2 = 12y \Rightarrow 2y^2 - 12y = 0 \Rightarrow 2y(y - 6) = 0 \Rightarrow \begin{cases} y = 0 \text{ (rejected)} \\ y = 6 \text{ (accepted)} \end{cases}$
 $\Rightarrow x = 2 \cdot 6 = 12$

Hence: $\begin{cases} x = 12 \\ y = 6 \end{cases}$

16 a) $A(t) = 100e^{-0.087 \times 9} = 0.0398(9)$
 b) $70 = 100e^{-0.087 \cdot t} \Rightarrow 0.7 = e^{-0.087t}$
 $\Rightarrow \ln 0.7 = -0.087t$
 $\Rightarrow t = \frac{\ln 0.7}{-0.087} = 0.41 \text{ day}$

c) $50 = 100e^{-0.087t}$
 $\Rightarrow 1 = 2e^{-0.087t}$
 $\Rightarrow \frac{1}{2} = e^{-0.087t}$
 $\Rightarrow \ln \frac{1}{2} = -0.087t$
 $\Rightarrow t = \frac{\ln \frac{1}{2}}{-0.087} = 0.797 \text{ day}$