$e^{5k} = 2$

taking ln of both sides

$5k = \ln 2$

$k = \frac{\ln 2}{5}$

$k = 0.1386$

Therefore the model is

$y = 20e^{0.1386t}$

b) Expressing 1½ days in hours

24hrs → 1day

∴ 1½ days = 36 hrs (i.e 24+12)

therefore imputing the value in the model

$y = 20e^{0.1386(36)}$

$y = 20e^{4.9896}$

$y = 20 \times 146.8777$

$y = 2937.554$

at $y = 10$, 30 and 50

at $y = 10$ (Since the same conditions still stand)

at $t = 0$ $y = 10$

$10 = Ce^{k(0)}$

$10 = Ce^{0}$

$10 = C$

Also Since y doubles every five hours

$20 = 10e^{5k}$

$\frac{20}{10} = e^{5k}$