

M102 #7 SOLUTIONS

1. a) EXPONENTIAL GROWTH: $N(t) = N_0 e^{kt}$

"TRIPLES EVERY 2 DAYS": $3N_0 = N_0 e^{2k}$

$$3 = e^{2k}$$

$$k = \frac{1}{2} \ln 3$$

IN 3 DAYS: $N(t) = N_0 e^{(\frac{1}{2} \ln 3) \cdot 3}$

$$\approx 5.2 N_0$$

THE POPULATION GROWS BY A FACTOR OF 5.2,

b) TO GROW TENFOLD: $10 N_0 = N_0 e^{(\frac{1}{2} \ln 3) \cdot t}$

SOLVE FOR t : $\ln 10 = \frac{1}{2} \ln 3 \cdot t$

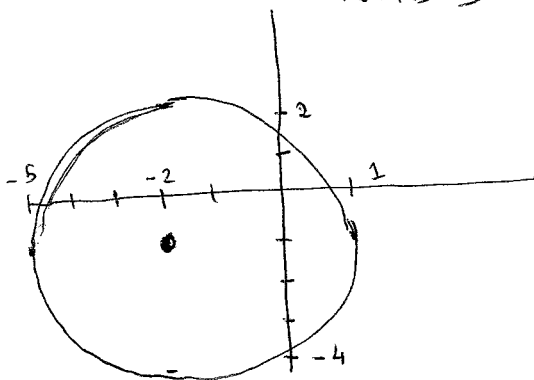
$$t = \frac{2 \cdot \ln 10}{\ln 3} \approx 4.2$$

IT WILL TAKE ABOUT 4.2 DAYS.

2. FIND LINE $C = mF + b$ THROUGH $(32, 0)$ AND $(212, 100)$

$$\Rightarrow C = \frac{5}{9} F - 17\frac{7}{9}$$

3. a) CIRCLE: CENTRE $(2, -1)$
RADIUS 3



b) ELLIPSE

SET $x=0 \Rightarrow y^2=4 \Rightarrow y=\pm 2$

SET $y=0 \Rightarrow x^2=9 \Rightarrow x=\pm 3$

