Question 1

\( N_0 = \£3000 \)
\( n = 2 \)
\( m = 1 + 0.02 = 1.02 \).

2% of $3000 = 1\% = 30.
2\% = 60.

After 1 year total = \£3060.

Year 2: 3060 \times 2\%
1\% = 30.60.
2\% = 30.60

\[ \times \frac{1}{2} \]
\[ \£61.20 \]

Total = 3060

\[ \frac{61.20}{3121.20} = \£3121.20p. \]
Question 2

\[ A_0 = £1600 \]
\[ n = 4 \]
\[ m = 4\% = \left(1 + 0.04\right) = 1.04 \]
\[ N = A_0 \times (m)^n \]
\[ = 1600 \times (1.04)^n \]
\[ = 1871.77\]p

Question 3

\[ N = A_0 \times (m)^n \]
\[ = 19,000 \times (0.85)^3 \]
\[ m = 1 - 0.15 = 0.85 \]
\[ = 11,054.25\]p

Question 4

\[ N = N_0 \times (m)^n \]

\( a) \)
\[ N = N_0 \times (m)^n \]
\[ = 2200 \times (1.11)^n \]
\[ = £2442 \]

\( b) \)
\[ N = N_0 \times (m)^n \]
\[ 3200 = 2200 \times (1.11)^n \]
\[ n = ? \]
\[ Try \ n^4 = 3200 \times 2200 \times (1.11)^4 = £3331.75 \]
\[ n^3 = 2200 \times (1.11)^3 = £3004.78 \]

\[ 4 \text{ Years} \]
Question 5

\[ N_0 = £600 \]
\[ n = 2 \]
\[ m = 1 + 0.1 = 1.1 \]

\[ N = N_0 \times (m)^n \]
\[ = 600 \times (1.1)^2 \]
\[ = 726 \]

\[ \frac{600}{1.1} = \frac{660}{1.21} \]
\[ \frac{600 \times 1.21}{1200} \]
\[ \frac{600}{1.21} = 726.00 \]

Interest earned = £726 - £600 = £126

Alt Method

Year 1 = £600 + 10% = £660 (±60)

Year 2 = £660 + 10% = £666 (±66)

±126
Question 6

\[ N_0 = \£400, \quad n = 2, \quad \text{Interest} = 5\% \]

Year 1: \(10\% \times \£400 = \£40\) \(5\% \times \£40 = \£2\) \(\text{Total Interest} = \£42\)

Year 2: \(\£420\) \(10\% = 42\) \(5\% = \£2\) \(\text{Total Interest} = \£41\)

Tim Incorrect.

Question 7

(a) \(H = 2m\)

\[ \frac{6\theta \times 2}{10\%} = 1.2m \] 1 Bounce

(b) \(1.2 \times 0.6 = 0.72m\) 2 Bounces

(c) \(20cm = 0.2m\)

\[
\begin{align*}
0.72 \times 0.6 &= 0.432m \quad 3 \text{ Bounces} \\
0.432 \times 0.6 &= 0.2592m \quad 4 \text{ Bounces} \\
0.2592 \times 0.6 &= 0.15552m
\end{align*}
\]

4 Bounces
Question 8

\[ N_0 = £600 \]

4 months = \( \frac{4}{12} \) of a year = \( \frac{1}{3} \)

\[ n = 8. \]

Scale factor = \( (1 - 0.08)^3 \)

\[
\begin{align*}
N_r &= N_0 \times (1 - 0.08)^3 \\
&= 600 \times (1 - 0.08)^3 \\
&= £467.21p.
\end{align*}
\]

Question 9

\[ N = N_0 \times (M)^n \]

\[
\begin{align*}
5200 \times (1.028)^4 &= £5807.32. \\
5200 \times (1.028)^9 &= £6667.17 \\
5200 \times (1.028)^{12} &= £7249.03 \\
5200 \times (1.028)^{11} &= £7045.76 \\
5200 \times (1.028)^{10} &= £6853.84
\end{align*}
\]

11 years.
Question 10.

Initial mass = 500 kg
Final n = 200 kg

\[ N = N_0 \times (m)^n \]
\[ \text{S. Factor} = (1 - 0.14) \]
\[ = 0.86 \]

\[ = 500 \times (0.86)^7 \]
\[ = 202.28 \text{ kg} \]

7 YEARS

Question 11.

\[ N_0 = £100 \]
\[ S. F = (1 + 0.045) \]
\[ = 1.045 \]

\[ N = N_0 \times (m)^n \]
\[ = 100 \times (1.045)^{15} \]
\[ = £193.52 \]

Should be £200 but is £193.52.
So mantyn will not double his money.