Exercise 1	Calc. : ✓

The 2$^{\text{nd}}$ term of a geometric sequence is 120 and the 4$^{\text{th}}$ term is 30.

1. Show that the common ratio is $\dfrac{1}{2}$.	3 marks
2. Find the sum of the first 7 terms of the sequence.	3 marks
3. Find the sum to infinity of the sequence.	2 marks

Exercise 2	Calc. : ✓

The 1$^{\text{st}}$ term of an arithmetic sequence is 5 and the common difference is 2. How many terms of this sequence must be added together before the sum is greater than 666? Draw a sketch to show this question to obtain full marks.	4 marks

Exercise 3	Calc. : ✓

The function $f(x) = x^4 + 4x^3 - 4x^2 - 16x$ is defined for $x \in \mathbb{R}$.

1. Use differentiation to determine the (x, y) coordinate for any stationary points of the function f.	2 marks
2. Classify the nature of any stationary points in terms of local maximum or minimum.	3 marks
3. Find the range of values for which the curve is increasing.	3 marks
4. Find the equation of the tangent at $x = 1$.	2 marks

Exercise 4	Calc. : ✓

In an examination hall, it is know that 12% of desks are wobbly.
In a row of 14 desks what is the probability that :

1. There were 0 wobbly desks.	2 marks
2. All the desks were wobbly.	2 marks
3. Less than 4 desks were wobbly.	2 marks

Exercise 5	Calc. : ✓

The workforce in a Mickey Mouse factory has to dress up for a fancy dress one day:

Costume \ Sex	Male	Female
Mickey Mouse	10	5
Minnie Mouse	2	12
Pluto	8	3

What is the probability that a member of the workforce is:

1. Minnie Mouse;	2 marks
2. Pluto and male;	2 marks
3. Male, given that they are dressed as Minnie Mouse.	2 marks

Give your answers to 2 decimal places.

Exercise 6 | Calc. : ✓

Make sure that calculator is set to radians for this question.
The depth of water at the end of a pier can be estimated by the function

$$d(t) = 5.6 \sin\left(\frac{\pi}{6}t\right) + 14.9$$

Where $d(t)$ is the depth of the water in metres and t is the number of hours after midnight.
Use your calculator to help you to <u>draw a sketch</u> of the graph of this function and to find the following:

1. What is the period of this function? | 2 marks

2. Estimate the depth of the water at midnight. | 1 mark

3. Estimate the depth of the water at 8am. | 1 mark

4. At what time will the water reach its highest point after midday? | 2 marks

Exercise 7 | Calc. : ✓

The depths of snow at a ski resort are collected every year for 12 years on 31st January. All data is in centimetres.

30, 75, 125, 55, 60, 75, 65, 65, 45, 120, 70, 110.

Calculate the following :

1. The modal depth of snow. | 1 mark

2. The mean. | 1 mark

3. The median. | 1 mark

4. Find the five number summary. | 2 marks

5. From this calculate the range and interquartile range. | 2 marks

6. Show the data in a box and whisker plot. | 3 marks