**Year 2018**

**VCE**

**Mathematical Methods**

**Trial Examination 1**

**Solutions**

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**Question 1**

**a.**  using the quotient rule

 M1

 A1

**b.** Let 

 chain rule



M1



 A1

**Question 2**



 A1





 since  M1

 A1

**Question 3**

**a.**  chain rule

 A1

 M1



 A1

**b.i.**  however  A1



**ii.** Using the product rule and **a.**



 for maximum M1



 since 

 A1

**Question 4**

**a.** 

 M1



 as the only answer A1

**b.** Let 

 M1

 A1

**Question 5**

**a.i** number of red, 0, 1, 2, 3, in a total of 10, so 

 A1

**ii. **

 A1

**b.** 

 A1



 A1

**Question 6**

**a.** completing the square



range  A1

 domain , range *R*

|  |  |  |
| --- | --- | --- |
|  |  |  |
| domain |  |  |
| range |  |  |

Since range domain , so  does not exist. A1

**b.** solving 

 M1

now , so if we now restrict the domain of *g*, as

domain  domain  now the range of *g*

so range domain , so now exist. A1



 A1

**Question 7**

**a.** Since it is discrete probability distribution 



 M1



 since 

but is not valid as  and each probability must be positive.

 are the only answers in  A1

**b.** 







 A1

**Question 8**

**a.** The sine wave part has a length of , and is one quarter of a cycle,

therefore one cycle  A1

**b.** Since the function is continuous at ,  A1

Since the total area under the curve is one.

 M1

 substitute , solve for *k* M1



 A1

**Question 9**

**a.** Let  using the product rule



 A1

**b.**  using the product rule



for turning points  M1



the minimum turning point is  A1

**c.** 

from **a.** 

 M1

 A1



 A1

**END OF SUGGESTED SOLUTIONS**