

$$\begin{aligned} 2. \quad & 2\log_3 6 - \log_3 4 \\ &= \log_3 6^2 - \log_3 4 \\ &= \log_3 \frac{36}{4} \\ &= \log_3 9 \\ &= \log_3 3^2 \\ &= 2\log_3 3 \\ &= \underline{\underline{2}} \end{aligned}$$

| Question                                                                                                                                            |  |  | Generic scheme                                                                                                                                                                                                                | Illustrative scheme                                                                                                                                                       | Max mark |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 2.                                                                                                                                                  |  |  | <ul style="list-style-type: none"> <li>•<sup>1</sup> apply <math>m \log_n x = \log_n x^m</math></li> <li>•<sup>2</sup> apply <math>\log_n x - \log_n y = \log_n \frac{x}{y}</math></li> <li>•<sup>3</sup> evaluate</li> </ul> | <ul style="list-style-type: none"> <li>•<sup>1</sup> <math>\log_3 6^2</math></li> <li>•<sup>2</sup> <math>\log_3 \frac{6^2}{4}</math></li> <li>•<sup>3</sup> 2</li> </ul> | 3        |
| <b>Notes:</b>                                                                                                                                       |  |  |                                                                                                                                                                                                                               |                                                                                                                                                                           |          |
| 1. Do not penalise the omission of the base of the logarithm at • <sup>1</sup> or • <sup>2</sup> .<br>2. Correct answer with no working, award 0/3. |  |  |                                                                                                                                                                                                                               |                                                                                                                                                                           |          |
| <b>Commonly Observed Responses:</b>                                                                                                                 |  |  |                                                                                                                                                                                                                               |                                                                                                                                                                           |          |
| <b>Candidate A - introducing a variable</b>                                                                                                         |  |  | <b>Candidate B</b>                                                                                                                                                                                                            |                                                                                                                                                                           |          |
| $\log_3 9$                                                                                                                                          |  |  | $2 \log_3 \left( \frac{6}{4} \right)$                                                                                                                                                                                         |                                                                                                                                                                           |          |
| • <sup>1</sup> ✓ • <sup>2</sup> ✓                                                                                                                   |  |  | • <sup>2</sup> ✗                                                                                                                                                                                                              |                                                                                                                                                                           |          |
| $3^x = 9$                                                                                                                                           |  |  | $\log_3 \left( \frac{6}{4} \right)^2$                                                                                                                                                                                         |                                                                                                                                                                           |          |
| $x = 2$                                                                                                                                             |  |  | • <sup>1</sup> ✓ 1 • <sup>3</sup> ^                                                                                                                                                                                           |                                                                                                                                                                           |          |