

# 2019 VCE Specialist Mathematics 1 (NHT) examination report

## Specific information

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

### Question 1a.

9

### Question 1b.

18

### Question 2

$$b = -4, c = 1, d = 26$$

### Question 3a.

(51, 65)

### Question 3b.

0.02, 0.03 accepted

### Question 4

$$\log_e \left( \frac{4}{3} \right)$$

### Question 5a.

$$30^\circ \text{ or } \frac{\pi}{6}$$

### Question 5b.

1

### Question 6

$$2\pi \log_e \left( \frac{9}{5} \right)$$

**Question 7**

$$-\frac{3}{2}$$

**Question 8**

$$\frac{123}{32}$$

**Question 9a.**

$$\begin{aligned} \tan\left(\frac{5\pi}{12}\right) &= \tan\left(\frac{\pi}{6} + \frac{\pi}{4}\right) \\ &= \frac{\tan\left(\frac{\pi}{6}\right) + \tan\left(\frac{\pi}{4}\right)}{1 - \tan\left(\frac{\pi}{6}\right)\tan\left(\frac{\pi}{4}\right)} \\ &= \frac{\frac{\sqrt{3}}{3} + 1}{1 - \frac{\sqrt{3}}{3}} \\ &= \frac{\sqrt{3} + 3}{3 - \sqrt{3}} \\ &= \frac{\sqrt{3} + 3}{3 - \sqrt{3}} \times \frac{3 + \sqrt{3}}{3 + \sqrt{3}} \\ &= \frac{6\sqrt{3} + 12}{6} \\ &= \sqrt{3} + 2 \end{aligned}$$

Alternatively, a double angle formula could have been used to show the given value.

**Question 9b.**

$$\frac{2\pi}{3}$$