2017 VCE Specialist Mathematics 2 (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.

Section A – Multiple-choice questions

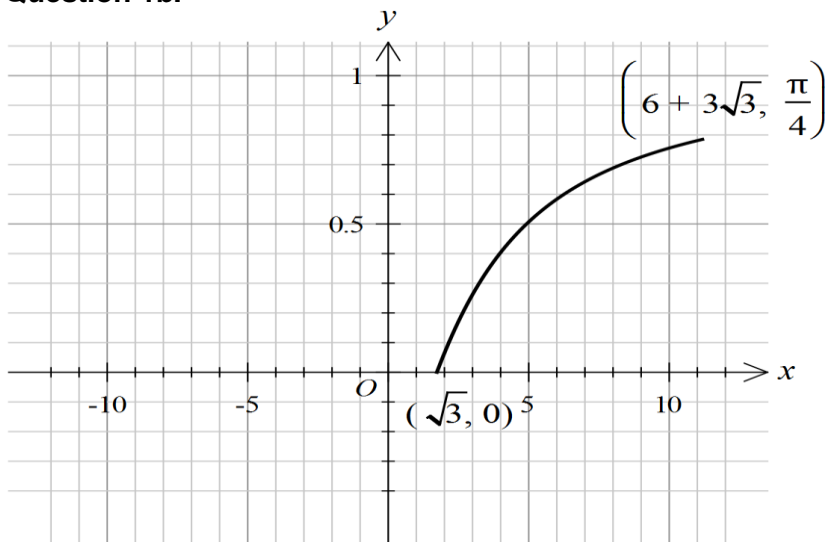| Question	Answer
1	D
2	D
3	B
4	E
5	C
6	C
7	B
8	D
9	E
10	A
11	D
12	B
13	A
14	E
15	C
16	E
17	C
18	B
19	C
20	A

Section B

Question 1ai.

$t^2 - 2\sqrt{3}t - 1 = 0$

Question 1aii.

Solve quadratic equation and identify correct root.

$\tan\left(\dfrac{5\pi}{12}\right) = \sqrt{3} + 2*$ Answer given

Question 1b.

Question 1ci.

$\pi \displaystyle\int_0^{\frac{\pi}{4}} 9\tan^2\left(y + \dfrac{\pi}{6}\right) dy$
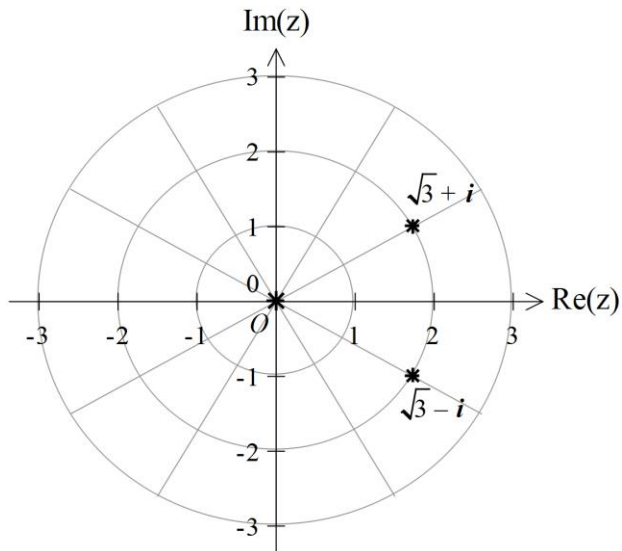
Question 1cii.

67

Question 1d.

0.007

Question 2ai.

$\sqrt{3} - i$

Question 2aii.

$z^2 - 2\sqrt{3}z + 4 = 0$

Question 2b.

Question 2c.

$y = -\sqrt{3}x + 2$

Question 2d.

$\left| z - \dfrac{2}{\sqrt{3}} \right| = \dfrac{2}{\sqrt{3}}$

Question 3ai.

$\dfrac{2}{P} + \dfrac{2}{1-P}$

Question 3aii.

Solve $\dfrac{dt}{dP} = \dfrac{2}{P} + \dfrac{2}{1-P}$ and rearrange to obtain

$\dfrac{t-c}{2} = \log_e \left(\dfrac{P}{1-P} \right)$ *   Answer given

Question 3aiii.

$P = \dfrac{e^{0.5t}}{1 + e^{0.5t}}$

Question 3b.

0.894

Question 3c.

$q = 0.62$, $r = 0.80$, $s = 1$

Question 3d.

$0.75 + 0.0504 \times 0.5 = 0.775$

Question 4a.

$15\underset{\sim}{i} + 15\sqrt{3}\underset{\sim}{j}$, $60°$

Question 4b.

Max height = 34.44

Question 4c.

5.302

Question 4d.

79.5

Question 4e.

distance = 78.4

Question 5a.

$T_1 - 5g\sin 30° = 5a$

$T_2 + 3g - T_1 = 3a$

$2g - T_2 = 2a$

Question 5b.

Solve the equation of motion simultaneously for a :

$a = \dfrac{g}{4}$ *Answer given

Question 5c.

$T_1 = \dfrac{15g}{4}$

$T_2 = \dfrac{3g}{2}$

Question 5d.

momentum = $5\sqrt{g}$

Question 5e.

$R = \dfrac{5g}{2}$

Question 6a.

$H_0 : \mu = 400\,000$, $H_1 : \mu > 400\,000$

Question 6b.

$p = \Pr\left(\text{sample mean} > 412\,000 \,|\, \mu = 400\,000\right)$

$p = 0.0228$

Question 6c.

Not accepted, that is, reject H_0 as $p < 0.05$

Question 6d.

$C = \$409\,870$

Question 6e.

$\Pr\left(\text{sample mean} < 410000 \,|\, \mu = 415000\right)$

$= 0.202$