2018 VCE Specialist Mathematics 2 (NHT) examination report

Specific information

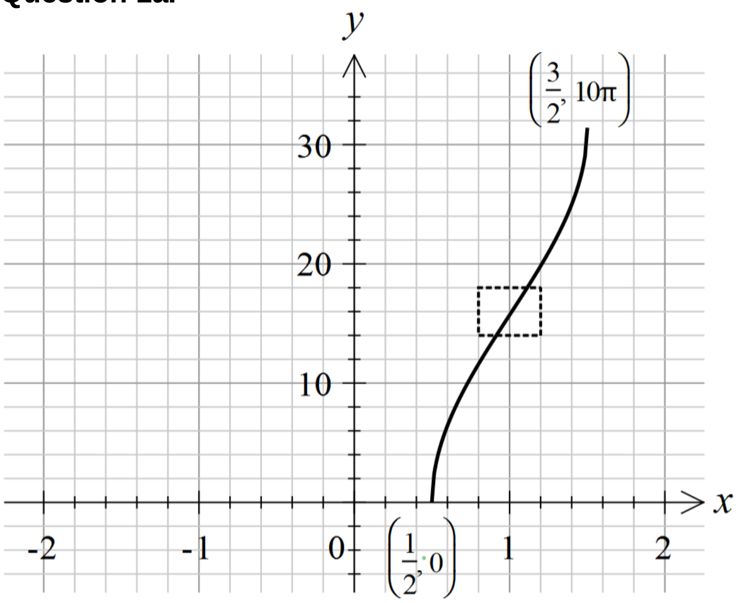
This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

Section A – Multiple-choice questions

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

Section B

Question 1a.



Question 1bi.

$$\int_0^{10\pi} \pi\left(1-0.5\cos\left(\frac{y}{10}\right)\right)^2 dy$$

Question 1bii.

$$\frac{45\pi^2}{4}$$

Question 1c.

$$\frac{20}{\pi}$$

Question 1d.

31.4

Question 2a.

$$(x+1)^2+y^2=\left(x+\frac{1}{2}\right)^2+\left(y-\frac{\sqrt{3}}{2}\right)^2$$

$$x^2+2x+1+y^2=x^2+x+\frac{1}{4}+y^2-\sqrt{3}y+\frac{3}{4}$$

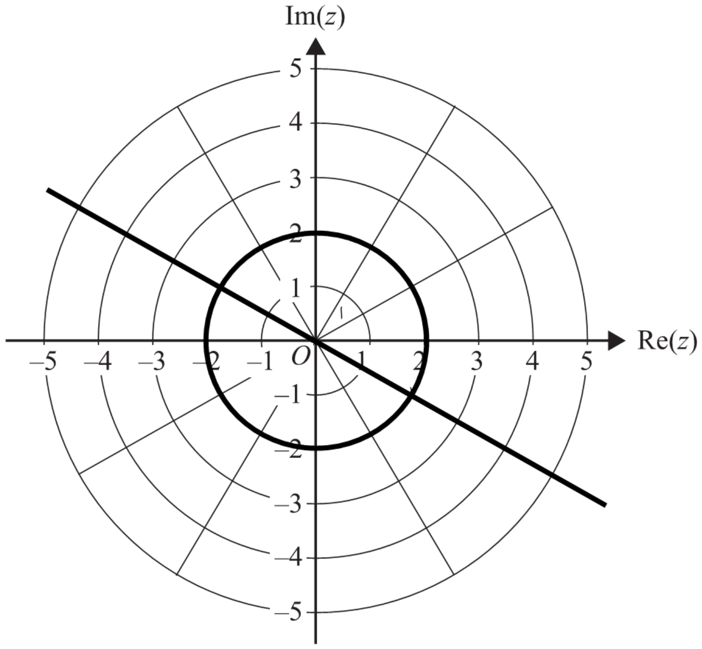
$$x=-\sqrt{3}y \Rightarrow y=-\frac{1}{\sqrt{3}}x$$

A ‘show that’ question such as this requires an explicit solution showing how the Cartesian equation of *L* was obtained from the given relation.

Question 2b.

$\left(\sqrt{3},-1\right),\left(-\sqrt{3},1\right)$

Question 2c.



Question 2d.

$-\frac{\pi}{6}$

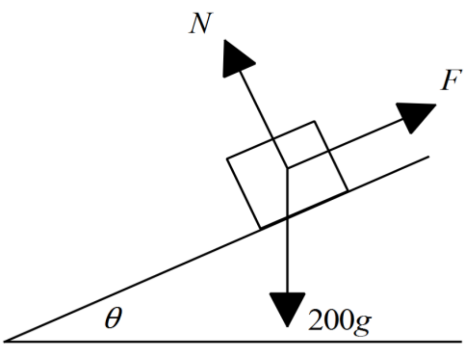
Question 2e.

$\frac{\pi}{3}+\sqrt{3}$

Question 2f.

$\text{cis}\left(-\frac{\pi}{3}\right)$

Question 3a.



Alternatively, the value 200g could be represented by a label such as *W*.

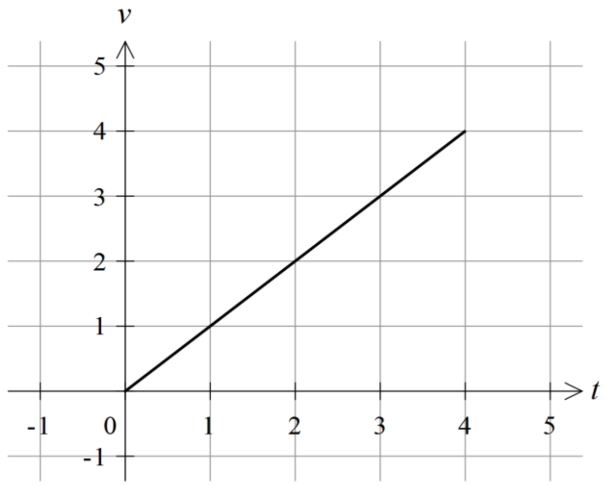
Question 3b.

$200g\sin(\theta) \quad (=1960\sin(\theta))$

Question 3ci.

$1\,(\text{m/s}^2)$

Question 3cii.



Question 3ciii.

8

Question 3d.

0.8

Question 3e.

12.9°

Question 4ai.

$\frac{5\sqrt{2}}{14}$

Question 4aii.

3

The position vector given is relative to the point of release, which was 1.75 m above floor level.

Question 4aiii.

1.28

Question 4b.

$29.7^\circ, 75.8^\circ$

Question 4c.

7.8

Question 5a.

$$80\frac{dy}{dx}=\frac{3}{2}x^2-4x+c,\quad 0=\frac{3}{2}\times2^2-4\times2+c,\quad c=2$$

$$80y=\frac{1}{2}x^3-2x^2+2x+d,\quad 0=\frac{1}{2}\times2^3-2\times2^2+2\times2+d,\quad d=0$$

$$80y=2x^2-\frac{1}{2}x^3-2x$$

Question 5b.

1.4°

Question 5c.

$x=\frac{2}{3}$, maximum deflection is $\frac{1}{135}$

Question 5d.

0.5°

Question 6a.

Mean 190, standard deviation 6.5

Question 6b.

0.062

Question 6c.

3.99

Question 7a.

$H_0:\mu=128$, $H_1:\mu>128$

$p=\Pr\left(\bar{X}>133\,|\,\mu=128\right)=0.006$

As $p<0.05$, reject H_0 (at the 5% level)

Question 7b.

$(130, 136)$