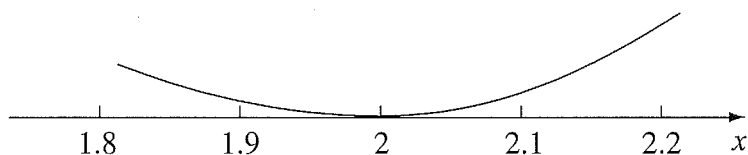## Sample Questions – Mathematics Extension 1

1 The velocity, v metres per second, of a particle moving in simple harmonic motion along the x-axis is given by the equation $v^2 = 36 - 9x^2$.

What is the amplitude, in metres, of the motion of the particle?

(A) 2

(B) 3

(C) 6

(D) 18

2 Part of the graph of $y = P(x)$, where $P(x)$ is a polynomial of degree four, is shown below.

Which of the following could be the polynomial $P(x)$?

(A) $P(x) = x^2(x + 2)^2$

(B) $P(x) = (x + 2)^4$

(C) $P(x) = x(x - 2)^3$

(D) $P(x) = (x - 1)^2(x - 2)^2$

3 The radius of a sphere is increasing at the rate of 6 centimetres per minute.

What is the rate of increase of the volume of the sphere, in cubic centimetres per minute, when the radius is 3 centimetres?

(A) 36π

(B) 144π

(C) 216π

(D) 864π

4   Which of the following represents the inverse function of $f(x) = \dfrac{2}{3x+6} - 1$?

(A) $f^{-1}(x) = \dfrac{2}{x+1} - 2$

(B) $f^{-1}(x) = 3 - \dfrac{2}{3x+3}$

(C) $f^{-1}(x) = 2 - \dfrac{1}{x+1}$

(D) $f^{-1}(x) = \dfrac{2}{3x+3} - 2$

5   How many solutions does the equation $\cos 2\theta = \sin\theta$ have in the domain $0 \le \theta \le 2\pi$?

(A)   2

(B)   3

(C)   4

(D)   5

Mapping Grid – Mathematics Extension 1

Sample Question	Marks	Answer	Content	Syllabus Outcomes
1	1	A	14.4E	HE3
2	1	D	16.3E	PE3
3	1	C	14.1E	HE5
4	1	D	15.1E	HE4
5	1	B	13.3	H5