

As a guideline this paper should be completed in 1 hour.

No Calculator to be used in this examination.

Section A [36 marks]

1. *[Maximum mark 6]*

a) Find the value of x in the equation $x = \log_3 27$.

b) Find the value of y in the equation $\log_2 y = 4$.

2. *[Maximum mark 5]*

The quadratic equation, $kx^2 - 5x - 10 = 0$, has one repeated solution.

Find the value of k .

3. *[Maximum mark 7]*

Solve the equation $2\cos^2 x = 3\sin x$, for values of x such that $0 \leq x \leq \pi$.

4. *[Maximum mark 6]*

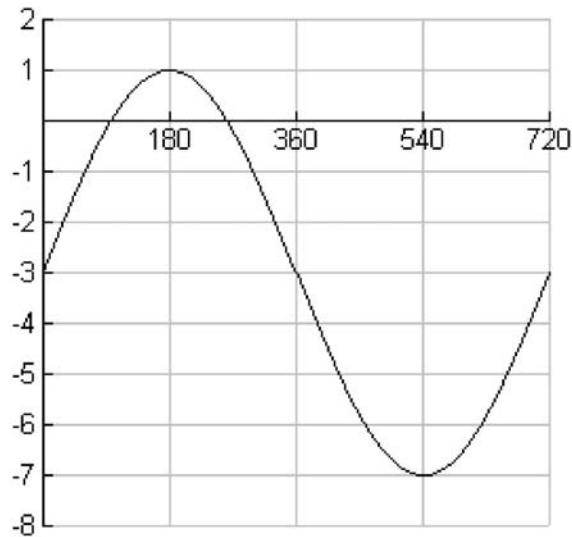
a) 1 7 21 35

is the start of a line Pascal's triangle.

Complete the line of Pascal's triangle.

b) Find the coefficient for the x^2 term in the expansion of $(x - 2)^7$.

5. [Maximum mark 6]

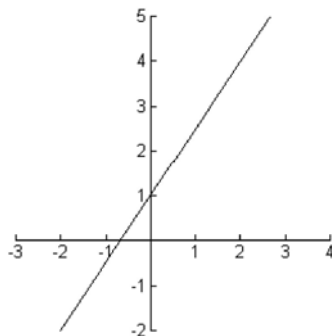


The graph above shows $y = a\sin(bx) + c$.

Find the value of a , b , and c .

6. [Maximum mark 6]

The diagram below shows a straight line that passes through the points $(0,1)$ and $(-2,-2)$.



Find a vector equation for the line, giving your answer in the form

$$r = \begin{pmatrix} x \\ y \end{pmatrix} + t \begin{pmatrix} a \\ b \end{pmatrix}.$$

Section B [24 marks]

7. [Maximum mark 24]

The function f is defined as $f(x) = 2x^2 - 5x - 3$.

- i) Write down $f'(x)$. [2 marks]
- ii) Show that the equation of the normal to the curve at the point where $x=1$ is given by $y = x - 7$. [4 marks]

The function g is defined as $g(x) = x - 7$.

- iii) Evaluate $g(x) = f(x)$. [2 marks]
- iv) Find the area bounded between the two functions, $f(x)$ and $g(x)$. [6 marks]
- v) Write the function $f(x)$ in the form $f(x) = a(x - p)^2 - q$, finding values for a , p , and q . [5 marks]
- vi) Sketch a graph of $f(x)$, indicating clearly on your diagram where the coordinate $(p, -q)$ lies. [3 marks]
- vii) Describe the transformation that maps $f(x)$ onto $-f(x)$. [2 marks]

Paper B

IB SL Paper 1 Practice Papers

Answers

1. a) $x = 3$

b) $y = 16$

2. $k = \frac{5}{8}$

3. $x = \frac{\pi}{3}, \frac{5\pi}{6}$

4. a) 1 7 21 35 35 21 7 1

b) -672

5. $a = 4, b = \frac{1}{2}, c = -3$

6. $r = \begin{pmatrix} 0 \\ 1 \end{pmatrix} + t \begin{pmatrix} -2 \\ -3 \end{pmatrix}$ or $r = \begin{pmatrix} -2 \\ -2 \end{pmatrix} + t \begin{pmatrix} 2 \\ 3 \end{pmatrix}$

7. i) $f'(x) = 4x - 5$

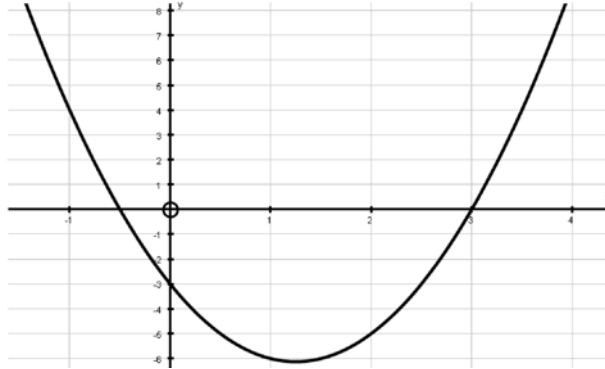
ii) $y = x - 7$

iii) $x = 1, x = 2$

iv) $\frac{1}{3}$

v) $2\left(x - \frac{5}{4}\right)^2 - \frac{49}{8}$

vi)



$$\left(\frac{5}{4}, -\frac{49}{8}\right)$$

vii) Reflection in x -axis.