# SKILLS CHECK

QUESTION 1

Find the coefficient of the $x^5$ term in the expansion of $\left(3+\frac{1}{3}x\right)^9$

QUESTION 2

Prove that $(\cos x - \sin x)^2 + (\sin x + \cos x)^2 = 2$

QUESTION 3

The graph of $y = x^2 - \frac{1}{3}x^3 + ax$ passes through (3,24). Find the x- coordinates of the stationary points

QUESTION 4

**a** = 4i – j and **b** = 3i + 2j . Find |2**b** – **a**|

QUESTION 5

The graph of $y = x^3$ is translated by vector $\begin{bmatrix}-1\\2\end{bmatrix}$ find the equation of the resulting graph in the form $y = x^3 + ax^2 + bx + c$

# SKILLS CHECK

QUESTION 1

Find the coefficient of the $x^4$ term in the expansion of $(x-1)(1+2x)^7$

QUESTION 2

Show that $1-\frac{sin\theta cos\theta}{tan\theta}=sin^2\theta$

QUESTION 3

If y = x(4 - x) calculate the finite area enclosed by the curve and the x - axis

QUESTION 4

If $q=\begin{pmatrix}-3\\4\end{pmatrix}$ find the vector parallel to q with magnitude 25

QUESTION 5

The graph of $y=\ x^2-2x$ is stretched by scale factor ½ parallel to the x-axis.
Find the equation of the resulting graph

# SKILLS CHECK

QUESTION 1

Find the coefficient of the $x^5$ term in the expansion of $\left(\frac{1}{3} - 3x\right)^{10}$

QUESTION 2

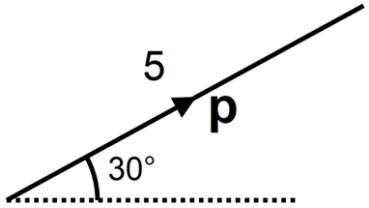
Show that $\frac{tan\theta sin\theta}{1+cos\theta} = \frac{1-cos\theta}{cos\theta}$

QUESTION 3

If $y = x^3 - 5x^2 + kx$ has a stationary point where x = 2, find the y coordinate of this stationary point

QUESTION 4

Express **p** in the from ai + bj




QUESTION 5

The graph of $y = x^3 + 2x^2 - x + 3$ is reflected in the y-axis.
Find the equation of the resulting graph

WEEK 3

# SKILLS CHECK

QUESTION 1

Find the coefficient of the $x^4$ term in the expansion of $(x^2 - 1)(2 - 3x)^5$

QUESTION 2

Show that $tan\theta + \frac{1}{tan\theta} = \frac{1}{sin\theta cos\theta}$

QUESTION 3

Sketch the graph of y = x(x - 1)(x - 3). Calculate the total area bounded by the graph of y and the x axis between x = 0 and x = 3

QUESTION 4

If $\overrightarrow{OX} = 4i - 8j$ and $\overrightarrow{OY} = -4i + 5j$ calculate $|\overrightarrow{XY}|$

QUESTION 5

The point (-1,2) lies on the graph of y = f(x). State the coordinates of its image when the graph is transformed to y = 2f(x)

# SKILLS CHECK

QUESTION 1

Find the coefficient of the $x^6$ term in the expansion of $\left(\frac{1}{2}+2x\right)^{12}$

QUESTION 2

Solve $\frac{4cos\theta-1}{tan\theta}=2sin\theta$ $\quad 0^o < \theta < 360^o$

QUESTION 3

Find the equation of the normal to the curve $y = 8x^4 - 3$ at the point where $x = -½$

QUESTION 4

ai + bj is a vector of magnitude $\sqrt{3}$ in the direction parallel to 3i – 3j
Find the exact values of and b.

QUESTION 5

The point (6,-10) lies on the graph of y = f(x). State the coordinates of its image when the graph is transformed to y = f(2x)

WEEK 5

# SKILLS CHECK

QUESTION 1

Find the coefficient of the $x^5$ term in the expansion of $(x^2 - 2)(2 - 2x)^6$

QUESTION 2

Solve $5sin\theta = 1 + 2cos^2\theta$ $\quad 0^o < \theta < 360^o$

QUESTION 3

Evaluate $\int_{-3}^{0}(2x + 3)^2 dx$

QUESTION 4

The position vector of A is 6i + 8j. The position of the midpoint of the line joining A and B is 3i + 2j. Find $|\overrightarrow{AB}|$

QUESTION 5

The point (-1,4) lies on the graph of y = f(x). State the coordinates of its image when the graph is transformed to y = f(x-1) + 3

# SKILLS CHECK

QUESTION 1

Find the coefficient of the $x^5$ term in the expansion of $\left(3-\frac{1}{3}x\right)^{11}$

QUESTION 2

Solve $\sin(3x - 60^o) = 0.5$ for $0^o \leq x \leq 360^o$

QUESTION 3

Find the equation of the tangent to the curve $y = x^2\sqrt{x}$ at the point where x = 4

QUESTION 4

O, A and B are vertices of a triangle. If $\overrightarrow{OA} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and $\overrightarrow{OB} = \begin{pmatrix} 8 \\ 0 \end{pmatrix}$ calculate the area of the triangle

QUESTION 5

The point (-5,-2) lies on the graph of y = f(x). State the coordinates of its image when the graph is transformed to

y = f(x+5) + 2