SKILLS CHECK

QUESTION 1

$y = x^2\sqrt{x-1}$ find $\frac{dy}{dx}$

QUESTION 2

$y = \frac{x^2}{x^2 - 4}$ find $\frac{dy}{dx}$

QUESTION 3

$f(x) = \frac{x+2}{x-2}$. Find $f^{-1}(x)$ and state the range of $f^{-1}(x)$

QUESTION 4

Find the equation of the perpendicular bisector of (1, -4) and (-5, 4)

QUESTION 5

A curve passes through (3,18) and is such that $\frac{dy}{dx} = \frac{1}{3}x^2 - 4x + 1$

Find y in terms of x

SKILLS CHECK

QUESTION 1

$y = e^x x^2$ find $\frac{dy}{dx}$

QUESTION 2

$y = \frac{x^3}{x^2 + 3x}$ find $\frac{dy}{dx}$

QUESTION 3

Express $4x^2 + 6x - 3$ in the form $a(x + b)^2 + c$

State the range of the function $f(x) = 4x^2 + 6x - 3$

QUESTION 4

The line $x + y = k$ where k is a constant is a tangent to the circle $x^2 + y^2 = 2x$. Find the possible values of k (leave your answers in surd form)

QUESTION 5

Find the finite area bounded by the curve $y = 16 - 4x^2$ and the x-axis

SKILLS CHECK

QUESTION 1

$y = x^2 sinx$ find $\frac{dy}{dx}$

QUESTION 2

$y = \frac{x^2}{\sqrt{x+1}}$ find $\frac{dy}{dx}$

QUESTION 3

Given that f(x) = $x^2 + 1$ and g(x) = 3x, solve the equation
fg(x) = gf(x)

QUESTION 4

A circle has equation $x^2 + y^2 - 4y - 14 = 0$. A chord of the circle has length 8. Find the perpendicular distance from the chord to the centre of the circle.

QUESTION 5

Evaluate $\int_2^4 1 + \frac{4}{x^3}\, dx$

SKILLS CHECK

QUESTION 1

$y = \sqrt{x}e^{2x}$ find $\frac{dy}{dx}$

QUESTION 2

$y = \frac{e^x}{x^2+1}$ find $\frac{dy}{dx}$

QUESTION 3

The function $f(x) = 16 - 6x - x^2 \qquad x \in \mathbb{R}$
Find the range of $f(x)$

QUESTION 4

Find the equation of the tangent to the circle
$(x + 1)^2 + (y - 3)^2 = 13$ at the point (2 , 5)

QUESTION 5

Find the value of the constant c given that

$$\int_0^4 c\sqrt{x}\, dx = 64$$

WEEK 4

SKILLS CHECK

QUESTION 1

$y = (x + 3)^3 x^2$ find $\frac{dy}{dx}$

QUESTION 2

$y = \frac{e^{2x}+x}{x+1}$ find $\frac{dy}{dx}$

QUESTION 3

$f(x) = \frac{ax+b}{x-b}$ $x \neq b$

Find $f^{-1}(x)$

QUESTION 4

The line with equation y = x + c is a tangent to the circle

$x^2 + y^2 - 8x + 6y + 17 = 0$

Find the 2 possible values of c

QUESTION 5

Evaluate $\int_1^2 \left(\frac{8}{x^3} + x^3\right) dx$

WEEK 5

SKILLS CHECK

QUESTION 1

$y = \sqrt[3]{x}\, e^{3x}$ find $\frac{dy}{dx}$

QUESTION 2

$y = \frac{\sqrt{x}}{x^2 + 2x}$ find $\frac{dy}{dx}$

QUESTION 3

$f(x) = 2e^{3x} + 1$

State the range and domain of $f^{-1}(x)$

QUESTION 4

The curve C has equation $y = x^2(x - 1)$ The points A and B lie on the curve and have x coordinates -1 and 2 respectively. Find the length of the line AB

QUESTION 5

Find the region enclosed by the curve $y = x^4 + 5$ and the line $y = 8$

WEEK 6

SKILLS CHECK

QUESTION 1

$y = x^2 \cos x$ find $\frac{dy}{dx}$

QUESTION 2

$y = \frac{e^{2x}}{x^2 - x}$ find $\frac{dy}{dx}$

QUESTION 3

Solve gf(x) = 0 where f(x) = ln (3x -1) and g(x) = e^{2x} -1

QUESTION 4

The straight line l_1 has gradient ⅓ and passes through (6,5)
The straight line l_2 is given by 4x + py – 6 = 0 intersects l_1 at (q, 2). Find the value of p and q

QUESTION 5

A curve passes through (-1, 0) and is such that $\frac{dy}{dx} = 4x^2 - \frac{4}{x^3}$
Find y in terms of x

WEEK 7