

Assignment 6

MA 1123

1. Find $\int f(x) dx$ for

$$(a) f(x) = x^3(x^2+1)^5$$

$$(b) f(x) = \frac{x}{x-1}$$

$$(c) f(x) = \frac{\sin \sqrt{x+1}}{\sqrt{x+1}}$$

$$(d) f(x) = \sin^2 x \cos^4 x$$

$$(e) f(x) = \sin^3 2x$$

$$(f) f(x) = \frac{x^2+1}{\sqrt{x^3+3x}}$$

2. Find the average value for $f(x)$

$$(a) f(x) = x^{1/3} \quad \text{between } x = -1 \text{ to } 8$$

$$(b) f(x) = \sin x \cos x \quad \text{between } x = 0 \text{ and } \pi/2$$

(c)

3. Suppose that the value of a yacht after t years is $V(t) = 275,000 \sqrt{\frac{20}{t+20}}$. What is the average value of the yacht over its first 10 years of use?

P.T.O.

4. Find the area bounded by $y = \sin x$, $y = \cos x$, $y = 0$ and $x = \pi$

5. Find the area bounded by the curves $y = x^2$ and $y = -x + 1$.

6. If $f(x) = 0$ all x irrational
 $= \frac{1}{q}$ where $x = \frac{p}{q}$ no cancellation
show $f(x)$ is continuous at
all irrational points and
discontinuous at all rational
points

7. Show that for the $f(x)$ in Q 6
that $\int_0^1 f(x) dx$ exists and
evaluate it.