

Calculus Review Worksheet

(1) Evaluate each of the following integrals please.

$$(a) \int_0^2 (x^4 + 4x^2) dx$$

$$(e) \int_e^{e^2} \frac{dx}{x \ln(x)}$$

$$(b) \int_0^2 \frac{3x dx}{\sqrt[3]{7x^2 - 1}}$$

$$(f) \int_{\frac{1}{2}}^{\frac{3}{4}} \frac{dx}{\sqrt{x}\sqrt{1-x}}$$

$$(c) \int_{-\frac{\pi}{4}}^{\frac{\pi}{2}} \sin^3(x) \cos(x) dx$$

$$(g) \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{\cos(x) dx}{1 + \sin^2(x)}$$

$$(d) \int_{-\frac{\pi}{8}}^{\frac{\pi}{8}} \tan^2(2x) dx$$

$$(h) \int_0^2 x^2 \sqrt{4 - x^2} dx$$

(2) Find the area under the graph of $y = x \sqrt{3x^2 + 4}$ and above the x-axis, between $x = 0$ and $x = 2$.

(3) Find the area under one arch of the graph of $y = 3 \cos(\pi x)$ and above the x-axis.

(4) Find the total area bound by the x-axis and the graph of $y = x^3 + 5x^2 + 6x$.

(5) Find the area bound by the graph of $2\sqrt{x} + \sqrt{y} = 2$ and the coordinate axes.

Calculus Review Worksheet

(6) Find $F'(x)$ if $F(x) = \int_{\sec(2x)}^1 \frac{dt}{t^2 - 1}$

(7) Find the total area bound by each of the following curves please.

(a) $y = x^2$ and $y = x + 2$

(b) $y = 6x - x^2$ and $y = x^2 - 2x$

(c) $x = y^2$ and $x = 3 - 2y^2$

(d) $y = \sin(x)$, and $y = \sin(2x)$ if $0 \leq x \leq \pi$

(e) $y = \tan^2(x)$, $y = 0$, and $x = \frac{\pi}{4}$

(f) $y = x^3 + x^2 - 2x$, and $y = -x^3 + x^2 + 6x$

(g) **Calculator Problem** $y = 2^{-x}$, and $y = 3x^2 - 2$ (Correct to 5 decimal places)

Calculus Review Worksheet

Answers

(1) (a) $\frac{256}{15}$

(e) $\ln(2)$

(b) $\frac{18}{7}$

(f) $\frac{\pi}{6}$

(c) $\frac{3}{16}$

(g) $\frac{\pi}{2}$

(d) $1 - \frac{\pi}{4}$

(h) π

(2) $\frac{56}{9}$

(3) $\frac{6}{\pi}$

(4) $\frac{37}{12}$

(5) $\frac{2}{3}$

Calculus Review Worksheet

Answers

(6) $F'(x) = -2 \csc(2x)$

(7) (a) $\frac{9}{2}$

(b) $\frac{64}{3}$

(c) 4

(d) $\frac{5}{2}$

(e) $1 - \frac{\pi}{4}$

(f) 16

(g) 4.28533