-1/2 point for each missed consta

Name: SOLUTIONS

A#:

Section:

1. Determine the following antiderivatives.

(a)
$$\int (6x^3 - 5\sqrt[4]{x} + 4) dx$$

$$= \int (-\frac{1}{4}x^4 - 5 - \frac{4}{5}x^{5/4} + 4) dx + C$$

$$= \frac{3}{5}x^4 - 4x^{5/4} + 4x + C$$

(b)
$$\int (x+1)(2x+1) dx$$

= $\int (2x^2 + 3x + 1) dx$
= $\frac{2}{3}x^3 + \frac{3}{2}x^2 + x + C$

(c)
$$\int \frac{5 - 4x^3 + 2x^6}{x^7} dx$$
$$= \int \left(5 \times -7 - 4 \times -4 + 2 \times -1\right) \int_{X}$$
$$= -\frac{5}{6} \times -6 + \frac{4}{3} \times -3 + 2 \ln|x| + C$$

(e)
$$\int e^{z}(e^{-z}+1) dz$$

$$= \int \left(1+e^{z}\right) dz$$

$$= z + e^{z} + C$$

$$(f) \int 2\cos(3t+1) dt$$

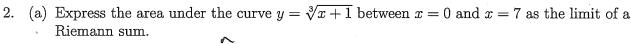
$$= \frac{2}{3}\sin(3t+1) + C$$

$$(g) \int \frac{dx}{3-4x} dx$$

$$= -\frac{1}{4} \ln |3-4x| + C$$

(h)
$$\int \frac{3x}{(1+x^2)^3} dx$$

= $\int 3 \times (1+x^2)^{-3} dx$
= $-\frac{3}{4} (1+x^2)^{-2} + C$
 $= -\frac{3}{4} \frac{1}{(1+x^2)^2}$



Themain sum.

$$\lim_{N \to \infty} \sum_{i=1}^{n} f(x_i) \Delta x, \quad \text{where } \Delta x = \frac{7 - 0}{n} = \frac{7}{n}$$

$$\lim_{N \to \infty} \sum_{i=1}^{n} \frac{7 \cdot 3}{n} \frac{7i}{n} + 1$$

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(b) Rewrite your answer to part (a) as a definite integral, and evaluate this integral.

$$\int_{0}^{3} \sqrt{x+1} \, dx = \int_{0}^{7} (1+x)^{1/3} \, dx$$

$$= \frac{3}{4} (1+x)^{1/3} \Big|_{0}^{7}$$

$$= \frac{3}{4} \left[8^{4/3} - 1^{4/3} \right]$$

$$= \frac{45}{4}$$

3. Evaluate the following definite integrals.

(a)
$$\int_{1}^{2} \left(\frac{3}{4x^{2}} - \frac{x^{2}}{2}\right) dx$$

$$= \left(-\frac{3}{4}x^{-1} - \frac{1}{6}x^{3}\right)\Big|_{1}^{2}$$

$$= \left(-\frac{3}{8} - \frac{8}{6}\right) - \left(-\frac{3}{4} - \frac{1}{6}\right)$$

$$= -\frac{41}{24} + \frac{22}{24} = \left[-\frac{19}{24}\right]$$
(b) $\int_{0}^{1} \frac{4}{t^{2} + 1} dt$

$$= 4 + an + t \Big|_{0}$$
(3) $= 4 + an + (1) - 4 + an + (0)$

= 4.7 - 4.0/

(c)
$$\int_{-1/2}^{1} e^{2x+1} dx$$

$$= \frac{1}{2} e^{2x+1}$$

$$= \frac{1}{2} e^{3} - 1$$

$$= \frac{2}{2} e^{3} - 1$$

(d)
$$\int_{1}^{4} \sqrt{z}(1+2z) dz$$
.

$$= \int_{1}^{4} \left(\frac{z^{1/2}}{2^{1/2}} + \frac{2z^{3/2}}{2z^{3/2}} \right) \frac{1}{2}$$

$$= \left(\frac{2}{3} \cdot \frac{3}{2} + \frac{4}{5} \cdot \frac{5}{2} \right) \frac{1}{4}$$

$$= \left(\frac{2}{3} \cdot \frac{3}{2} + \frac{4}{5} \cdot \frac{3}{2} \right) - \left(\frac{z}{3} + \frac{4}{5} \right)$$

$$= \frac{464}{15} - \frac{2z}{15}$$

$$= \frac{44z}{15}$$