Calculus Name_____

Review for Integration Test

Date_____ Period____

For each problem, approximate the area under the curve over the given interval using 4 left endpoint rectangles.

1) $y = -\frac{x^2}{2} - x + 5;\ [-4, 0]$

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For each problem, approximate the area under the curve over the given interval using 4 midpoint rectangles.

2) $y = \frac{x^2}{2} + 2;\ [0, 4]$

$\frac{37}{2} = 18.5$

Evaluate each sum.

3) $\sum_{k=1}^{n} (16k^2 + 12)$

$\frac{16n^3}{3} + 8n^2 + \frac{44n}{3}$

Evaluate each limit.

4) $\lim_{n\to\infty} \sum_{k=1}^{n} \left(\frac{14}{n} + \frac{49k}{n^2}\right)$

$\frac{77}{2} = 38.5$

5) $\lim_{n\to\infty} \sum_{k=1}^{n} \left(\frac{12}{n} + \frac{27k^2}{n^3}\right)$

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Evaluate each definite integral.

6) $\int_{-2}^{1} (-x^4 + 3x^2 - x - 1)\, dx$

$\frac{9}{10} = 0.9$

7) $\int_{-6}^{-2} -2x^{\frac{1}{3}}\, dx$

$-3\sqrt[3]{2} + 9\sqrt[3]{6} \approx 12.574$

8) $\int_2^4 \frac{2}{x^3}\,dx$

$\frac{3}{16} \approx 0.188$

9) $\int_1^2 \frac{3}{x}\,dx$

$3\ln 2 \approx 2.079$

10) $\int_{-3}^{1} -2e^x\,dx$

$\frac{-2e^4+2}{e^3} \approx -5.337$

11) $\int_{-\pi}^{\frac{5\pi}{6}} -\cos x\,dx$

$-\frac{1}{2} = -0.5$

12) $\int_0^{\frac{\pi}{6}} -2\sec^2 x\,dx$

$-\frac{2\sqrt{3}}{3} \approx -1.155$

13) $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} -\sec x\tan x\,dx$

$\frac{-3\sqrt{2}+2\sqrt{3}}{3} \approx -0.26$

14) $\int_{-4}^{-3} \frac{3}{(2x+4)^2}\,dx$

$\frac{3}{8} = 0.375$

15) $\int_{-4}^{-2} -3e^{x+2}\,dx$

$\frac{-3e^2+3}{e^2} \approx -2.594$

16) $\int_0^2 \frac{4x}{(x^2+2)^3}\,dx$

$\int_2^6 \frac{2}{u^3}\,du;\ u = x^2+2$

17) $\int_{-2}^{0} 6x(x^2-3)^2\,dx$

-28

18) $\int -40x^4\sec^2(4x^5-5)\,dx$

$-2\tan(4x^5-5)+C$

19) $\int -\frac{25e^{5x}}{\cos^2(e^{5x}-5)}\,dx$

$-5\tan(e^{5x}-5)+C$

20) $\int -\frac{60x^2}{5x^3+2}\,dx$

$-4\ln\left|5x^3+2\right|+C$

21) $\int -24xe^{4x^2+3}\,dx$

$-3e^{4x^2+3}+C$