Atividade 5 – Integral Definida

Nome:____

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Atividade5
Entregar a resolução numa folha anexa.

1) Calcule as integrais definidas abaixo:

a) $\int_{-1}^{2} 6x^4 dx$

b) $\int_{0}^{2\pi} \text{sen}(2x)dx$

c) $\int_{-2}^{2} \left(\frac{x^3}{3} - 2x^2 + 7x + 1\right)dx$

d) $\int_{0}^{4} (\sqrt{2x+1})\, dx$

e) $\int_{1}^{2} (6x - 1)dx$

f) $\int_{-1}^{2} x(1 + x^3)dx$

g) $\int_{-3}^{0} (x^2 - 4x + 7)dx$

h) $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} senxcosxdx$

i) $\int_{-1}^{1} \frac{x^2}{\sqrt{x^3+9}} dx$

j) $\int_{1}^{2} \frac{5x^3+7x^2-5x+2}{x^2} dx$

Fórmulas de Integração Básica

$$\int dx = \int 1 dx = x + c$$

$$\int x^n dx = \frac{x^{n+1}}{n+1} + c \quad n \neq -1,\ n \text{ racional}$$

$$\int \operatorname{sen} x\, dx = -\cos x + c$$

$$\int \cos x\, dx = \operatorname{sen} x + c$$

$$\int \sec^2 x\, dx = tg\, x + c$$

$$\int \cos ec^2 x\, dx = -\cot g\, x + c$$

$$\int \sec x\, tg\, x\, dx = \sec x + c$$

$$\int \cos ec\, x\, cotg\, x\, dx = -\cos ec\, x + c$$

$$\int e^{kx} dx = \frac{1}{k} e^{kx} + c$$

$$\int \frac{1}{x} dx = \ln x + c, \quad x > 0$$

$$\int \frac{1}{\sqrt{a^2 - x^2}} dx = \operatorname{arcsen} \frac{x}{a} + c$$

$$\int \frac{1}{a^2 + x^2} dx = \frac{1}{a} arctg \frac{x}{a} + c$$

$$\int \frac{1}{x\sqrt{x^2 - a^2}} dx = \frac{1}{a} arc \sec \frac{x}{a} + c$$

$$\int a^x dx = \left(\frac{1}{\ln a} \right) a^x + c \quad a > 0, a \neq -1$$

TABELA – Derivadas

- ***Derivadas***: Sejam u e v funções deriváveis de x e n constante.
  1. $y = u^n \Rightarrow y' = n u^{n-1} u'$.
  2. $y = u\, v \Rightarrow y' = u' v + v' u$.
  3. $y = \frac{u}{v} \Rightarrow y' = \frac{u' v - v' u}{v^2}$.
  4. $y = a^u \Rightarrow y' = a^u (\ln a)\, u', \quad (a > 0,\ a \neq 1)$.
  5. $y = e^u \Rightarrow y' = e^u u'$.
  6. $y = \ln u \Rightarrow y' = \frac{1}{u} u'$.
  7. $y = u^v \Rightarrow y' = v\, u^{v-1}\, u' + u^v (\ln u)\, v'$.
  8. $y = \operatorname{sen} u \Rightarrow y' = u' \cos u$.
  9. $y = \cos u \Rightarrow y' = -u' \operatorname{sen} u$.
  10. $y = tgu \rightarrow y' = \sec^2 u . u'$