Date:

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Kelas : A

TUGAS 10 (INTEGRAL)

Carilah anti turunan $f(x) + C$

1. $f(x) = 3x^2 + 10x + 5$ ...

$$\int f(x) = \int 3x^2 + 10x + 5$$
$$= \frac{3x^3}{3} + \frac{10x^2}{2} + \frac{5x^1}{1} + C$$
$$= x^3 + 5x^2 + 5x + C \;//$$

2. $F(x) = x^2(20x^7 - 7x^5 + 6)$
$$= 20x^9 - 7x^7 + 6x^2$$

$$\int f(x) = \int 20x^9 - 7x^7 + 6x^2$$
$$= \frac{20x^{10}}{10} - \frac{7x^8}{8} + \frac{6x^3}{3} + C$$
$$= 2x^{10} - \frac{7}{8}x^8 + 2x^3 + C \;//$$

3. $f(x) = x^{-3/4}$

$$\int f(x) = \int x^{-3/4}$$
$$= \frac{x^{-3/4+1}}{1/4} + C$$
$$= \frac{4}{1} x^{1/4} + C$$
$$= 4x^{1/4} + C$$
$$= 4\sqrt[4]{x} + C \;//$$

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Selesaikan integral tak tentu berikut

4. $\int (x^2-4)^3 2x\,dx$

misal : $v = x^2-4$; $dv = 2x\,dx$

$dx = \frac{dv}{2x}$

$\Rightarrow \int (v)^3 \cdot 2x \cdot \frac{dv}{2x}$

$= \int v^3 \cdot dv$

$= \frac{1}{4} v^4 + C$

$= \frac{1}{4} (x^2-4)^4 + C$ //

5. $\int (x^2-3x+2)^2 (2x-3)\,dx$

misal : $v = x^2-3x+2$; $dv = 2x-3\,dx$

$dx = \frac{dv}{2x-3}$

$\Rightarrow \int (v)^2 \cdot 2x-3 \cdot \frac{dv}{2x-3}$

$= \frac{1}{3} v^3 + C$

$= \frac{1}{3} (x^2-3x+2)^3 + C$ //

No.

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Hitung $\int_0^5 f(x)\,dx$

b. $f(x) = \begin{cases} x+2, & 0 \le x < 2 \\ 6-x, & 2 \le x \le 5 \end{cases}$

$$\int_0^5 f(x) = \int_0^2 (x+2)\,dx + \int_2^5 (6-x)\,dx$$

$$= \frac{1}{2}x^2 + 2x \Big|_0^2 + 6x - \frac{1}{2}x^2 \Big|_2^5$$

$$= \left((2+4)-(0)\right) + \left(\left(30 - \frac{25}{2}\right) - (12-2)\right)$$

$$= 6 + \frac{15}{2}$$

$$= \frac{27}{2} = 13\frac{1}{2} //$$

7. $f(x) = |x-1| = \begin{cases} x-1, & x \ge 1 \\ -(x-1), & x < 1 \end{cases}$

$$\int_0^5 f(x) = \int_0^1 -(x-1)\,dx + \int_1^5 (x-1)\,dx$$

$$= -\frac{1}{2}x^2 + x \Big|_0^1 + \frac{1}{2}x^2 - x \Big|_1^5$$

$$= \left(\left(-\frac{1}{2}+1\right)-(0)\right) + \left(\left(\frac{25}{2}-5\right) - \left(\frac{1}{2}-1\right)\right)$$

$$= \frac{1}{2} + 8$$

$$= \frac{17}{2}$$

$$= 8\frac{1}{2} //$$