

NAME; NWOGA THELMA OZICHUKWU

MATH 104

19/ MATHS01/265

MEDICINE AND SURGERY

$$\textcircled{1} \int \frac{11-3x}{x^2+2x-3} dx$$

$$\int \frac{x^2+2x-3}{x^2+2x-3}$$

$$x^2+2x-3=0 \Rightarrow (x-1)(x+3)$$

$$\frac{11-3x}{(x-1)(x+3)}$$

$$\frac{11-3x}{(x-1)(x+3)} = \frac{A}{x-1} + \frac{B}{x+3}$$

$$(x-1)(x+3) = x^2 - x + 3$$

$$11-3x = A(x+3) + B(x-1)$$

$$\text{let } x = -3$$

$$11 - 3(-3) = A(-3+3) + B(-3-1)$$

$$20 = 0 + (-4B)$$

$$B = -5$$

$$\text{let } x = 1$$

$$11 - 3(1) = A(1+3) + B(1-1)$$

$$8 = 4A + 0$$

$$A = 2$$

$$\frac{11-3x}{(x-1)(x+3)} = \frac{2}{x-1} + \frac{-5}{x+3}$$

$$\int \left[\frac{2}{x-1} - \frac{5}{x+3} \right]$$

$$2 \ln|x-1| - 5 \ln|x+3| + C$$

$\textcircled{2}$

$$\int \frac{x-16}{x^2-2x-3} dx$$

$$\int \frac{x^2-2x-3}{x^2-2x-3}$$

Solu.

$$x^2 - 2x - 3 = 0 \rightarrow (x+1)(x-3)$$

$$4x - 16$$

$$\frac{4x - 16}{(x+1)(x-3)}$$

$$= \frac{A}{x+1} + \frac{B}{x-3}$$

$$4x - 16 = A(x-3) + B(x+1)$$

let $x = 3$

$$4(3) - 16 = A(3-3) + B(3+1)$$

$$-4 = 4B$$

$$B = -1$$

let $x = -1$

$$4(-1) - 16 = A(-1-3) + B(-1+1)$$

$$-20 = -4A + 0$$

$$A = 5$$

$$4x - 16 = \frac{5}{x+1} - \frac{1}{x-3}$$

$$(x+1)(x-3) \left[\frac{5}{x+1} - \frac{1}{x-3} \right] + C$$

$$= 5|x+1| - |x-3| + C$$

$$= 5|x+1| - |x-3| + C$$

$$3. \int \frac{2x^2 - 9x - 35}{(x+1)(x-2)(x+3)} dx$$

Solution.

$$= \frac{A}{x+1} + \frac{B}{x-2} + \frac{C}{x+3}$$

$$2x^2 - 9x - 35 = A(x-2)(x+3) + B(x+1)(x+3) + C(x+1)(x-2)$$

let $x = -3$

$$2(-3)^2 - 9(-3) - 35 = A(-3-2)(-3+3) + B(-3+1)$$

$$18 + 27 - 35 = A(0) + B(-2)$$

$$(-3+3) + C(2+1)(2-2)$$

$$8 - 18 - 35 = 0 + 15B + 0$$

$$-45 = 15B$$

$$B = -3$$

let $x = -1$

$$2(-1)^2 - 9(-1) - 35 = A(-1-2)(-1+3)$$

$$+ B(-1+1)(-1+3) + C(-1+1)(-1+2)$$

$$2 + 9 - 35 = -6A + 0 + 0$$

$$-24 = -6A$$

$$A = 4$$

$$2x^2 - 9x - 35 = \frac{4}{x+1} - \frac{3}{x-2} + \frac{1}{x+3}$$

$$\left[\frac{4}{x+1} - \frac{3}{x-2} + \frac{1}{x+3} \right] + C$$

$$= 4|x+1| - 3|x-2| + |x+3| + C$$