

Applications of the Definite Integral in Geometry and Improper Integrals

การประยุกต์ปริพันธ์ในทางเรขาคณิต และปริพันธ์ ไม่ตรงแบบ

8.1 Area between Curves

พื้นที่ระหว่างโค้ง

ข้อ 107

107.1 $A + B$

107.2 E

107.3 $D - E$

107.4 $-D - E + F + G$

ข้อ 108

108.1 $A + C$

108.2 $-B + C + D + E$

108.3 $A + B - D$

108.4 $-D$

ข้อ 109

109.1 -5

109.2 11

109.3 29

109.4 -19

109.5 34

109.6 11

ข้อ 110

110.1 C

110.2 $-F$

110.3 $-D - E$

110.4
$$\int_{-1}^0 [h(x) - f(x)] dx$$

ข้อ 111

111.1
$$\int_0^2 \left(\sin x - \frac{x-1}{4} \right) dx$$

111.2
$$\int_{-3}^0 [\sqrt{3-2x} - (-x)] dx + \int_0^{3/2} \sqrt{3-2x} dx$$

ข้อ 112

112.1
$$\int_0^1 e^x dx + \int_1^3 \left(e^x - \frac{x-1}{2} \right) dx$$

112.2
$$\int_0^1 (2y+1) dy + \int_1^{e^3} (3 - \ln y) dy$$

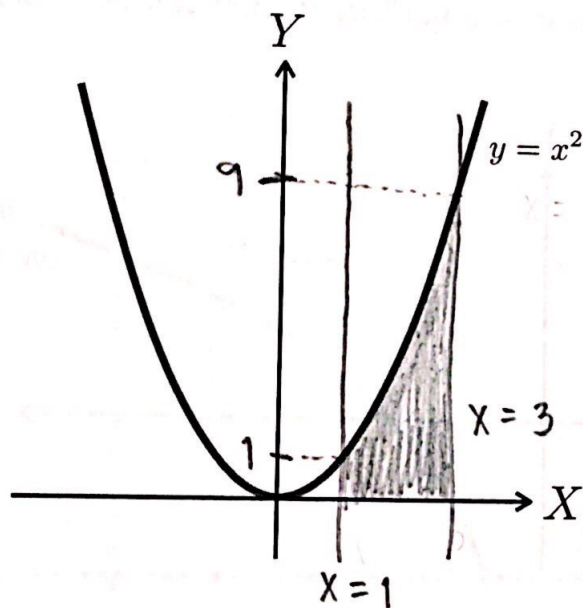
ข้อ 113

113.1
$$\int_{1/2}^1 \left(1 - \frac{1}{2x} \right) dx + \int_1^2 \left(1 - \frac{x}{2} \right) dx$$

113.2
$$\int_{1/2}^1 \left(2y - \frac{1}{2y} \right) dy$$

ข้อ 114

114.1



$$114.2 \quad \int_0^1 (3-1) dy + \int_1^9 (3-\sqrt{y}) dy$$

8.2 Volume by Revolving the Axis

ปริมาตรทรงตันที่เกิดจากการหมุน

ข้อ 115

$$115.1 \quad \int_1^e \pi (\ln x)^2 dx$$

$$115.2 \quad \int_1^e 2\pi x (\ln x) dx$$

$$115.3 \quad (\text{Disk/washer}) \int_1^e \pi [(\ln x + 1)^2 - 1^2] dx$$

$$(\text{Shell}) \int_0^1 2\pi (y+1) (e - e^y) dy$$

ข้อ 116

$$116.1 \quad \int_0^1 \pi (x^2)^2 dx + \int_1^2 \pi [(x^2)^2 - (\ln x)^2] dx$$

$$116.2 \quad \int_0^1 \pi [1^2 - (\sqrt{y})^2] dy$$

$$116.3 \quad \int_0^1 2\pi(y+1)(1-\sqrt{y}) dy$$

ข้อ 117

$$117.1 \quad \int_1^2 \pi (4x^2)^2 dx$$

$$117.2 \quad \int_1^2 2\pi x(4x^2) dx$$

$$117.3 \quad \int_1^2 \pi [(4x^2 + 1)^2 - 1^2] dx$$

ข้อ 118

$$118.1 \quad \int_0^4 (f-g) dx + \int_4^6 (p-q) dx$$

$$118.2 \quad \int_0^4 2\pi x(f-g) dx + \int_4^6 2\pi x(p-q) dx$$

$$\text{ข้อ 119} \quad \int_0^{1/4} \pi [(\sqrt{x} + 1)^2 - (x^2 + 1)^2] dx$$

ข้อ 120 π **ข้อ 121**

- The method of revolution : Disks/Washers

- About the axis : $x = -\frac{1}{2}$

- $V = \int_0^d \pi \left[\left(g(y) + \frac{1}{2} \right)^2 - \left(f(y) + \frac{1}{2} \right)^2 \right] dy$

ข้อ 122

- The method of revolution : Cylindrical Shell
- About the axis : y -axis
- $V = \int_0^b 2\pi x [s(x) - t(x)] dx$

8.3 Improper Integrals

ปริพันธ์ไม่ตรงแบบ

ข้อ 123 Express the following improper integrals in terms of appropriate limits.

จงเขียนอินทิกรัลไม่ตรงแบบต่อไปนี้อยู่ในรูปลิมิตที่เหมาะสม

$$123.1 \quad \lim_{a \rightarrow -\infty} \int_a^0 5^x dx + \lim_{b \rightarrow +\infty} \int_0^b 5^x dx$$

$$123.2 \quad \lim_{a \rightarrow 2^+} \int_a^3 \frac{5}{(x-1)(x-2)} dx + \lim_{b \rightarrow +\infty} \int_3^b \frac{5}{(x-1)(x-2)} dx$$

$$123.3 \quad \lim_{a \rightarrow 0^+} \int_a^1 \frac{\ln(1+x^2)}{x^2} dx + \lim_{b \rightarrow +\infty} \int_1^b \frac{\ln(1+x^2)}{x^2} dx$$

$$123.4 \quad \lim_{a \rightarrow -\infty} \int_a^0 dx + \lim_{b \rightarrow +\infty} \int_0^b dx$$

$$123.5 \quad \lim_{k \rightarrow 2^-} \int_1^k \frac{1}{x(x-2)} dx + \lim_{a \rightarrow 2^+} \int_a^3 \frac{1}{x(x-2)} dx + \lim_{b \rightarrow +\infty} \int_3^b \frac{1}{x(x-2)} dx$$

$$123.6 \quad \lim_{a \rightarrow -\infty} \int_a^0 \frac{1}{x^2+3} dx + \lim_{b \rightarrow +\infty} \int_0^b \frac{1}{x^2+3} dx$$

$$123.7 \quad \lim_{b \rightarrow 2^+} \int_1^b \frac{1}{x(x-2)} dx + \lim_{a \rightarrow 2^-} \int_a^4 \frac{1}{x(x-2)} dx$$

$$123.8 \quad \lim_{a \rightarrow -\infty} \int_a^{-1} \frac{1}{x} dx + \lim_{b \rightarrow 0^-} \int_{-1}^b \frac{1}{x} dx$$

ข้อ 124

124.1 6

124.2 diverges

124.3 6

124.4 diverges

ข้อ 125

125.1
$$\int_1^{\infty} \pi \left[\left(\frac{1}{x} \right)^2 - \left(\frac{1}{2x} \right)^2 \right] dx$$

125.2
$$\lim_{b \rightarrow \infty} \int_1^b \pi \left[\left(\frac{1}{x} \right)^2 - \left(\frac{1}{2x} \right)^2 \right] dx$$